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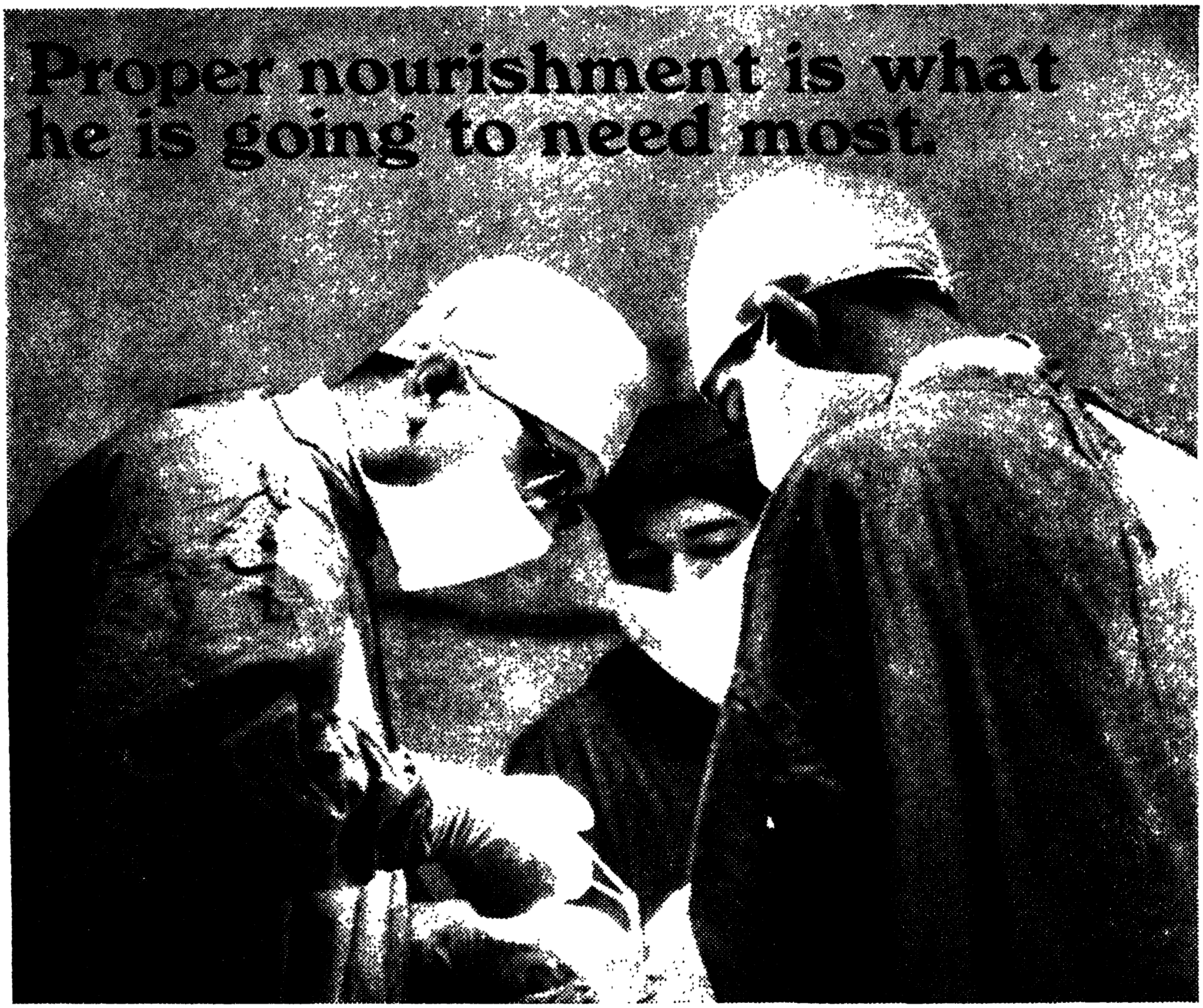
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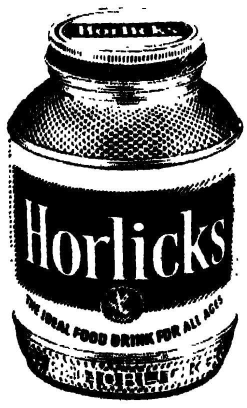

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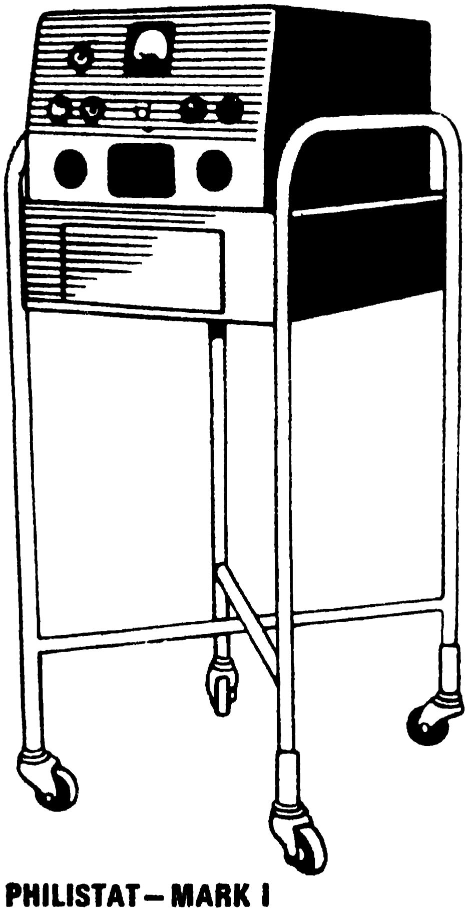

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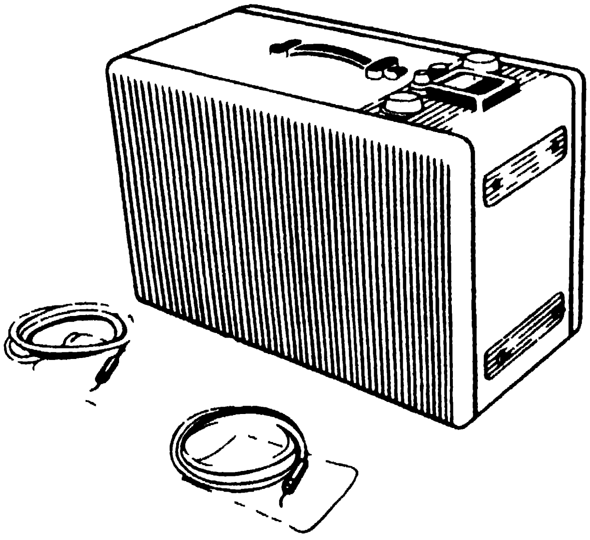

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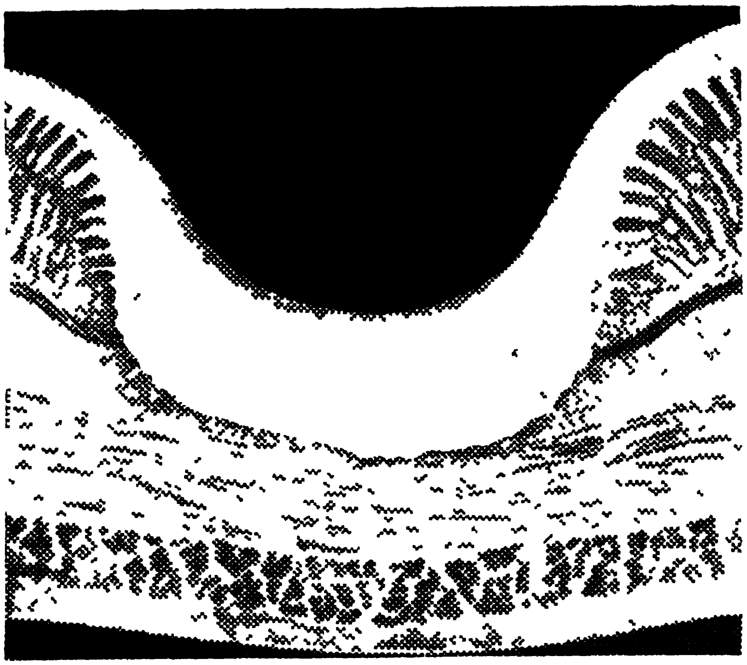

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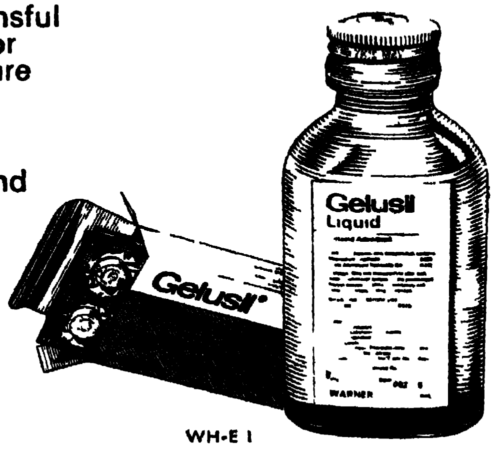

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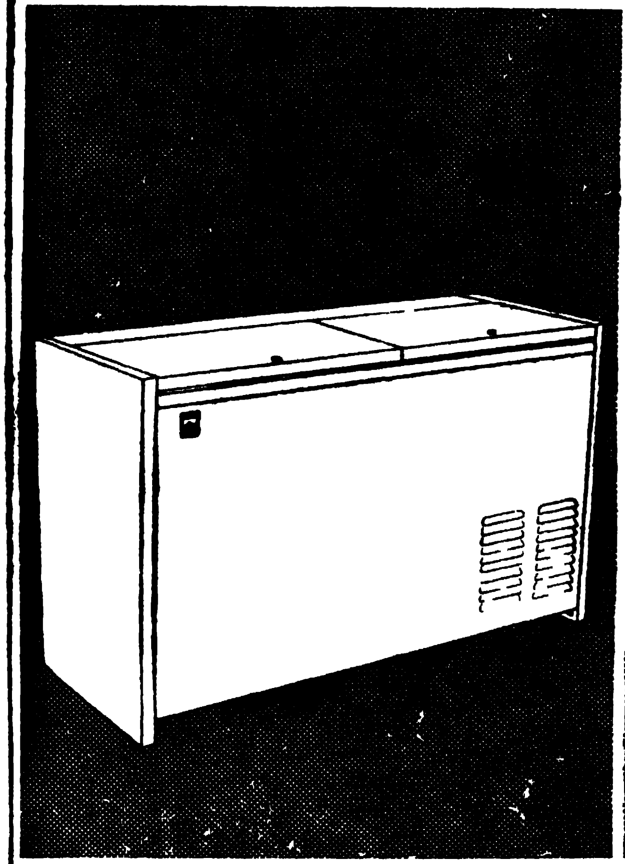

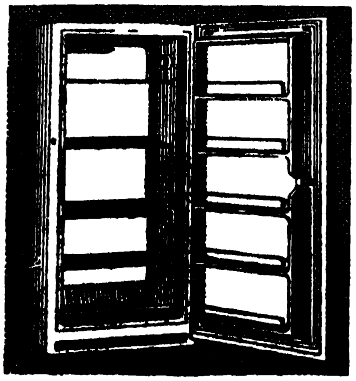

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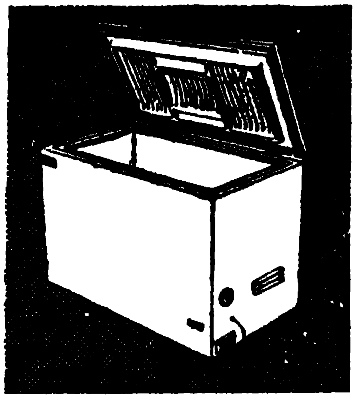

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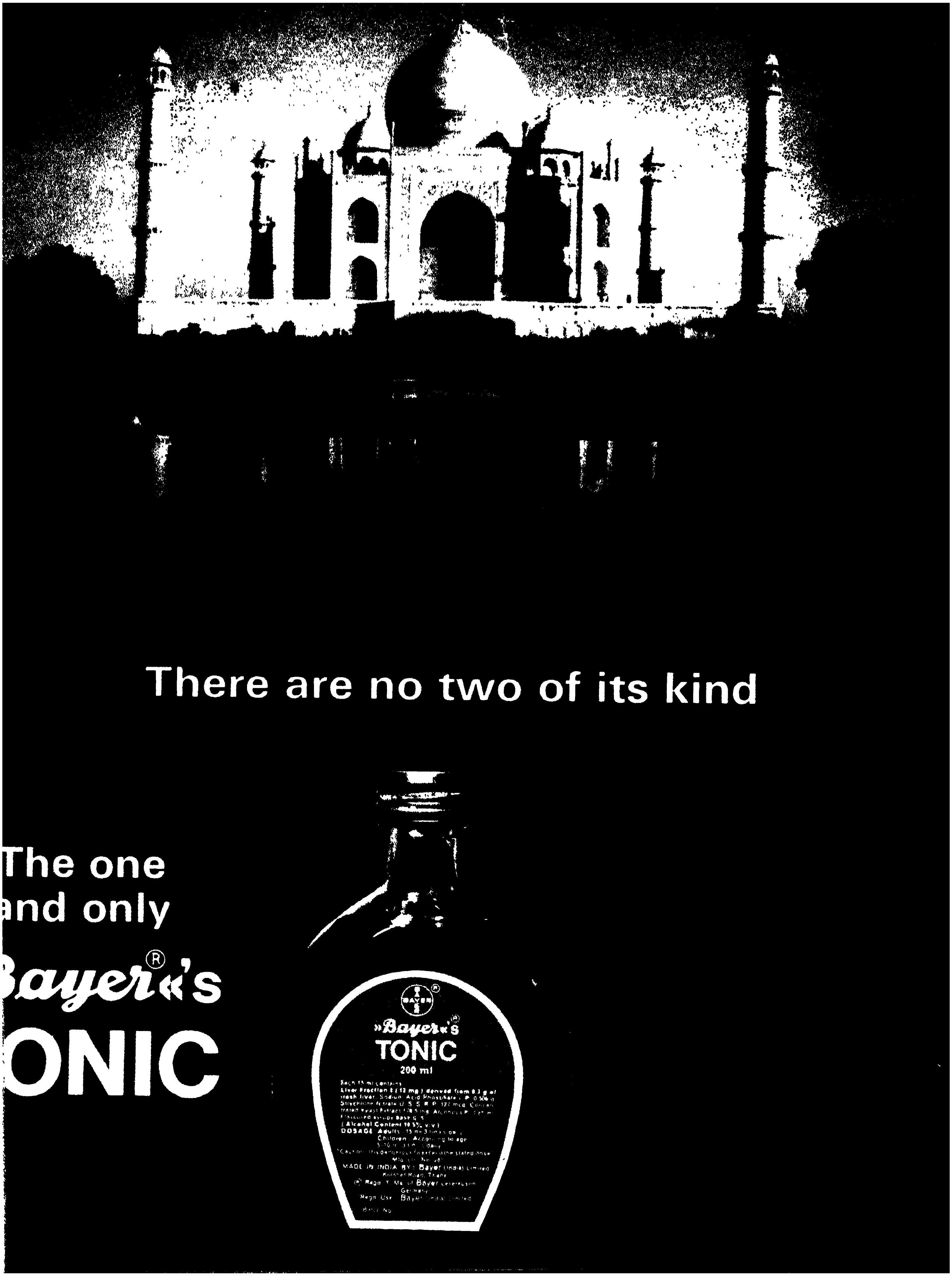
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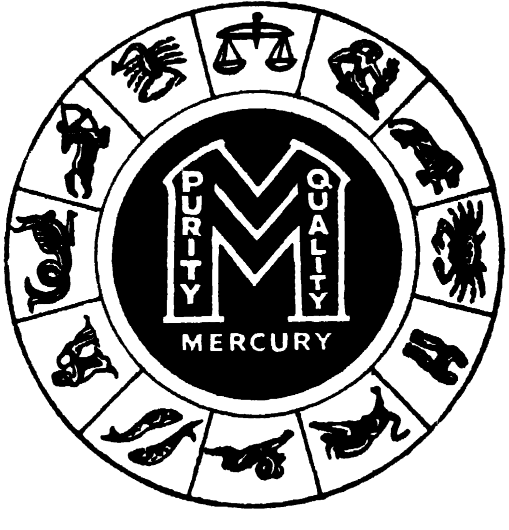

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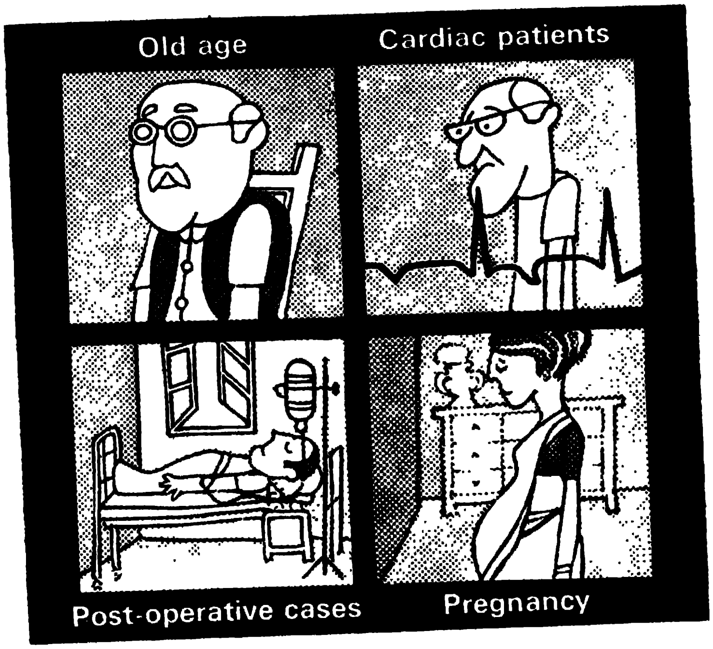

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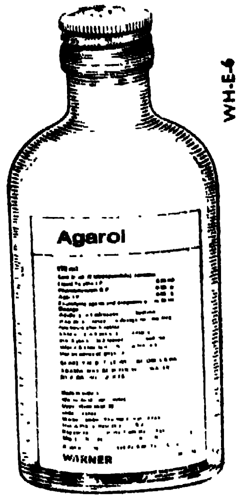

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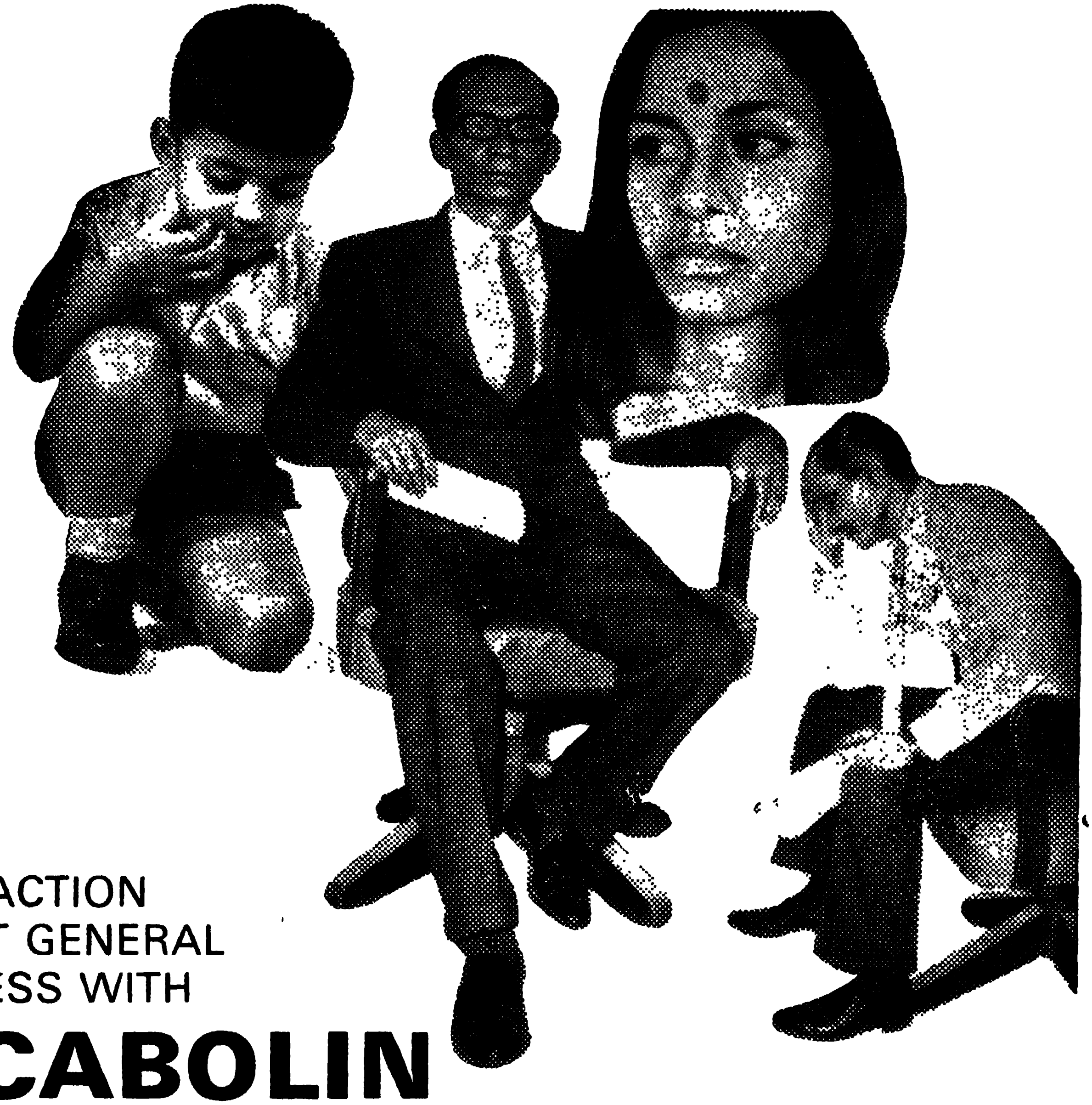

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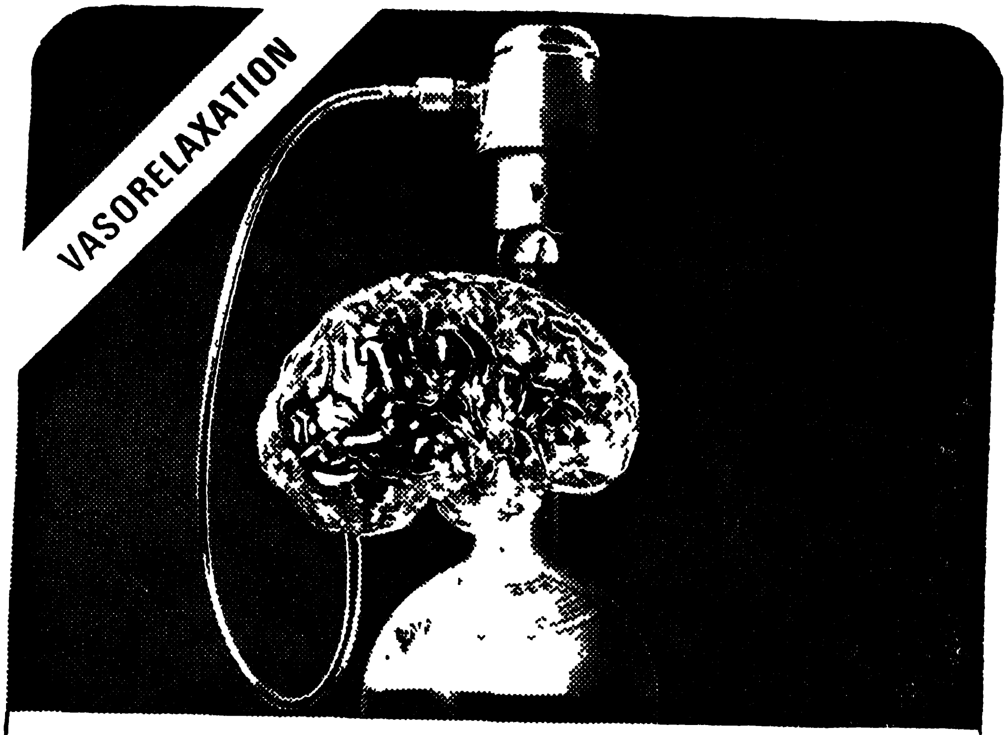

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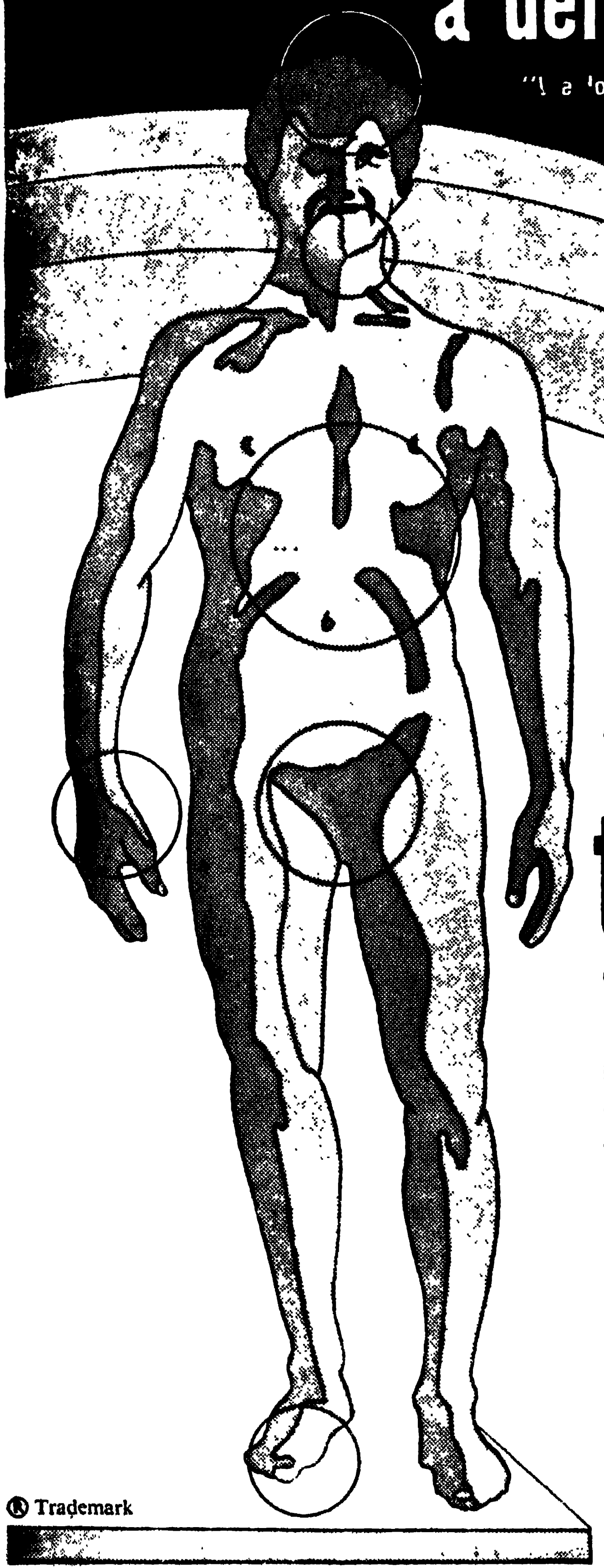

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ORIGINALS AND PAPERS

1

A Study of Filariasis in an Aggregated Community of Banaras Hindu University Township

S. M. MARWAH*, N. S. RAO**, S. D. GAUR***

[Received for publication October 28, 1970]

The Banaras Hindu University (BHU) is a central residential university in India. Its township houses the staff, their families and the students from all over the country; and thus provides a herd of its own type for the epidemiological studies in aggregation. An effort was made to explore the role of some of the factors in the epidemiology of filariasis in the aggregated community of the township.

MATERIAL AND METHOD

During the period of this study, the BHU township had 603 staff residential quarters and 17 students hostels including one for ladies within its masonry boundary wall. The population by door to door census in the staff quarters was 3069. The students population was 4125. The total population of the township was 7194. A detailed filaria survey of the township was made. This included (i) a review of the filaria related environmental and the medical factors of the township associated with the prevalence of filaria, (ii) the entomological study of the adult mosquitoes and (iii) the human survey by standard methods. For the entomological studies, the semicircular township (radius 2 km.) was divided radially into six zones, each of which was visited once a week for catching adult mosquitoes both from the random and the fixed catching stations by the hand catching techniques. In each zone, the collection of the adult mosquitoes was made separately for each hostel and the staff quarters during the period of one academic year excluding the summer vacation months of May and June. The mosquitoes were counted, identified and dissected in the laboratory.

For human survey all the 7194 persons were contacted by door to door visits between 8 P.M. and 12 midnight. Only those persons were dropped out of the survey who refused to be pricked during three persuasive visits. In all 4938, i.e., 68·6 per cent of the residents were pricked for blood smears (20 c.mm. approx.) and questioned for histories of swellings by the technicians trained for the purpose. The blood slides were dehaemoglobinised, stained by Leishman stain on the following morning and examined. All positive slides were most carefully scrutinised for *Brugia malayi* infection especially among the persons coming from the *B. malayi* endemic areas of India. Varanasi is endemic only for *Wucheraria bancrofti* infection.

The analysis of the data incorporated the following factors :

Age and sex factors.

Socio-economic factors—No detailed compilation of the incomes was done. However, the staff data were analysed in terms of academic, minis-

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terial and class IV (lowest socio-economic group) staff.

Period of stay in the BHU township—The data were analysed separately for the persons originating from the Varanasi district and from outside the Varanasi district for their comparative infection rates according to the various periods of stay in the BHU township. These analyses were done separately for the staff and the students.

Infection level of the home districts—All the 4938 persons were divided into two groups, i.e., those coming from home districts with infection levels of $\leqslant 5$ and >5 per cent. For infection levels of the home districts, the ICMR figures (1961) were utilised. The districts reported free from the filarial infection were grouped under $\leqslant 5$ per cent infection level group. These comparative analyses were done separately for the students and the staff. Hostelwise differences of the human rates were especially explored.

RESULTS

Filaria related environmental and medical factors—The township is situated to the south of Varanasi, half a mile from the river Ganges in the State of Uttar Pradesh. The compact township has an area of 1300 acres out of which 300 acres constituted playgrounds. The township is planned in three semicircles (Fig. 1). The outermost semicircle was constituted by the staff residential quarters, the middle semicircle provided 17 hostels with warden quarters and the innermost semicircle provided 15 colleges with watchmen quarters. The township had own watersupply from six deep tubewells. The township sewage lines covered the residential and the hostel semicircles. The colleges had septic tank latrines, which discharged their effluents in the *kachha* rain water drains at the back of the colleges. In fact during the survey period, 54 spots (charted in the map) with heavy Culex breeding were detected mostly in the 30 miles of *kachha* rain water drains on both sides of 15 miles of well laid roads of the township.

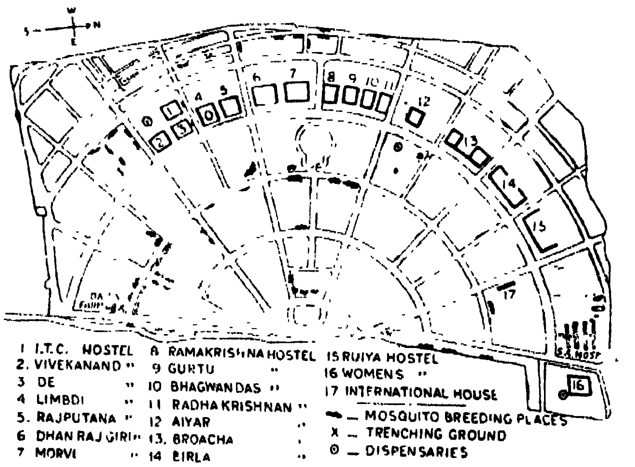

FIG. 1

With the exception of December or January days with less than 10°C and May or June days with more than 43°C, the BHU (along with Varanasi) climate could be considered conducive for development of both the vectors and the parasites. The total rainfall during the period of the study was 37·90" with the average humidity range of 55·6 to 91·1.

During the period of the studies, the township health office used 9,000 litres of malarial for weekly spray of the breeding places. In addition seven rounds of door to door spraying was done for anti-adult measures. However, the mean manhour density of adult mosquitoes for the period was 21·4 (Table 1).

TABLE 1—SHOWING MANHOUR DENSITY AND FILARIAL INFECTION RATES AMONG MOSQUITOES IN HOSTELS AND STAFF COLONIES

Place of mosquito collection hostels	Period of collection in misutes	Manhour density	Infection rate	Infectivity rate	Remarks
ITC	Not done		--	---	A total of 4165 mosquitoes were collected. Out of 2986 female *Culex fatigans* dissected, 373 and 33 were positive for microfilariae and stage IV larvae respectively. Other female species collected were *Anopheles subpictus*, (115), *annularis*, (9), *culicifacies* (3), and *Aedes aegpti* (2). The mosquito rates were the averages of ten months (academic year) collections.
Vivekanand	1,070	17·1	10·0	0·4	
S. C. Dey	990	18·8	11·9	1·4	
Limbdi	520	24·3	12·4	1·1	
Rajputana	700	18·1	11 3	1·6	
Dhanrajgiri	360	21·2	19·3	0·0	
Morvi	440	20·4	12·5	0·0	
Ramkrishna	360	22·7	13·8	3·1	
A. N. Gurtu	460	21·4	13·0	0·0	
Bhagwan Dass	440	21·4	12·0	0·0	
Radhakrishna	800	22·3	13·8	1·6	
Aiyer	520	20·3	11·5	1·3	
Broacha	240	21·0	13·3	0·0	
Birla	220	26·2	11·1	0·0	
Ruiya	120	23·0	10·5	0·0	
International	Not done			--	
Total Boys	7,240	20·5	12·2	1·0	
Girls	Not done		--	—	
Staff colonies					
S. S. Hospital compound	740	22·0	17·4	1·2	
New Nizam colony	610	19·4	16·1	1·6	
Jodhpur	540	20·8	7·3	0·7	
Principal	255	17·8	10·7	0·0	
Old Nizam	820	22·3	11·8	1·4	
Chhittupur	820	31·1	14·2	1·3	
Town committee area	670	21·5	10·4	1·3	
Total: Staff colonies	4,455	22·8	12·9	1·3	
Grand total: Township	11.695	21·4	12·5	1·1	

Table 2—Showing Filarial Infection and Disease Rates and Average Infestation amongst Students and Residents

Residential Hostel	Population inhabited	Population covered No.	Population covered %	Infection rate	Disease rate	Average infestation/20 c.mm.
ITC ...	164	55	33·6	5·4	9·1	27·0
Vivekanand ...	196	157	80·1	1·9	1·9	6·7
S. C. Dey ...	188	91	48·4	0·0	0·0	0·0
Limbdi ...	300	215	71·7	2·8	6·9	12·5
Rajputana ...	300	203	67·7	3·7	5·9	26·0
Dhanrajgiri ...	355	158	44·5	3·2	4·4	6·2
Morvi ...	303	211	69·6	6·2	0·9	10·0
Ramkrishna .	146	130	89·0	3·8	4·6	17·8
A. N. Gurtu	191	182	95·3	9·9	9·3	18·2
Bhagwan Dass ...	94	93	98·9	16·1	10·7	14·8
Radhakrishna ...	157	146	93·0	9·6	12·3	23·1
Ayer ..	132	117	88·6	7·7	17·1	11·2
Broacha ...	205	432	85·5	11·8	7·6	30·3
Birla ..	520	412	79·2	13·6	18·9	30·1
Ruiya ...	191	187	97·9	6·4	4·8	16·3
International ..	33	24	72·7	0·0	0·0	0·0
Total Boys	3,775	2,813	74·5	7·7	8·4	22·6
Girls	350	279	79·7	2·5	0·7	5·1
Both ...	4,125	3,092	75·0	7·3	7·7	22·1
Total staff colonies ...	3,069	1,846	60·1	10·4	4·3	19·8
Grand total of township ..	7,194	4,938	68·6	8·4	6·4	21·0

In the year preceding the studies, the township's three dispensaries treated 216 filaria (clinically diagnosed) outpatients cases out of 32,472 total attendance (6·65 per 1000 outpatients) by diethylcarbamazine. During the period of study, in addition to the above the authors treated 417 microfilaria carriers detected during the survey for follow-up studies

Discussions

TRANSMISSION HAZARD:

Since the infection rates of the 17 hostels and the various categories of the staff were individually studied, an assessment of any possible differentials in the transmission hazard within the township was made. The differences in the manhour densities and the infection rates for the mosquitoes were found to be statistically insignificant between the various hostels and zones of the residences (P>0·20 for manhour densities and x^2=0·09, P>0·70 for infection rate). As such the whole township could be considered as one operational area so far as the hazard of transmission was concerned. Joe *et al.* (1960) considered the area surveyed by them near Djakarta as one operational area for the hazard of filaria transmission.

AGE AND SEX FACTORS:

In the families the lowest age positive for microfilaria was 5 years and the highest was 75 years both for the males and the females. The agewise rising trend in the males was seen till 30 years of age, then a decline was noted followed by a final rise above 50 years (Table 3). In the females with the exception of −20 and −50 year groups, the trend was continuous. In the literature the range of the lowest age reported were 1-6 years. (Raghavan and Krishnan, 1949; Krishnaswamy, 1955; Basu, 1957; Datta, 1960; Park, 1961, 1962 a, b, c, and d). However, the concept is that microfilariae are seldom seen below 3-4 years. Further, it is usually accepted and reported in the literature that the infection rate rises with the age in the earlier years, i.e., up to 20-30 years. This difference is probably due to the fact that some persons developing disease become negative for microfilariae (Raghavan, 1951) or in the alternative immunity mechanism may be partly responsible for the same. However, in the aggregated community, the older age periods from non-endemic areas are bound to respond like younger age period of the endemic areas.

Owing to the small number of the female students (279 girls out of 3092 students covered 9 per cent), it is not scientific to assume that the factors other than the sex were equalised in the series. Otherwise the male to female sex ratio of the infection rates in the students was 3·1 : 1. In the families, the differences in the males (infection rate 10·7 per cent and average infestation of 19·1) and the females (infection rate 9·9 per cent and average infestation of 21·1, Table 3) were insignificant (x^2=0·26, P>0·50 for infection and t=0·87, P>0·30 for average infestation). The male to female ratio was 1·1 : 1. Patnayak and Nayak (1955) reported male to female ratio of 1·6 : 1. In literature the reports usually indicated higher rates in the males though the indicators for insignificant differences (Joe *et al.*, *loc. cit.*) and higher rates in the females (Jordon, 1960) also existed. However, it could be perhaps presumed that the sex differences, if any, were not affected during aggregation of persons from areas with different levels of infection.

For the swellings, the lowest age in the series was 7 years in the male and 5 years in the female. The highest was 68 years in the male and 57 years in the female. In the families, out of 59 swelling histories of the males, 40 were owing to hydroceles and 8 to the swelling of the genitalia. Otherwise it did appear (Table 4) that the females perhaps gave

TABLE 3—SHOWING AGE AND SEXWISE DISTRIBUTION OF FILARIAL INFECTION, DISEASE RATES AND AVERAGE INFESTATION

Age group (in years)	Sex	Population	Covered	Per cent	Mf.	Infection rate	Disease	Disease rate	Average infestation per 20 c.mm.
				FAMILIES					
1—5	M	281	131	46·6	1	0·8	Nil	0·0	14·0
	F	224	86	38·4	1	1·2	Nil	0·0	4·0
6—10	M	245	163	66·5	8	4·9	4	2·4	17·0
	F	203	113	55·7	12	10·6	2	1·8	23·9
11—20	M	399	302	75·7	31	10·3	13	4·3	18·0
	F	270	157	58·1	11	7·0	7	4·5	21·5
21—30	M	263	230	87·4	42	18·3	20	8·7	23·8
	F	291	167	57·4	22	13·2	4	2·4	22·0
31—40	M	216	153	70·8	18	11·8	8	5·2	13·0
	F	184	113	61·4	15	13·3	4	3·5	13·8
41—50	M	149	92	61·7	10	10·9	9	9·8	26·6
	F	108	46	42·6	5	10·9	2	4·3	16·2
>50	M	142	66	47·2	12	17·9	5	7·5	10·5
	F	94	27	28·7	4	14·8	1	3·7	34·2
Total	M	1695	1137	67·1	122	10·7	59	5·2	19·1
	F	1374	709	51·6	70	9·9	20	2·8	21·1
Both	sexes	3069	1846	60·1	192	10·4	79	4·3	19·8
				STUDENTS					
—20	M	NA	1621	---	127	7·8	141	8·7	26·0
	F	NA	232	--	6	2·6	1	0·4	5·5
21—30	M	NA	1161		91	7·8	90	7·7	17·7
	F	NA	46	·	1	2·2	1	2·2	3·0
>30	M	NA	31	—	Nil	0·0	4	12·9	0·0
	F	NA	1	—	Nil	0·0	Nil	0·0	0·0
Total	M	NA	2813	--	218	7·7	235	8·4	22·6
	F	NA	279	---	7	2·5	2	0·7	5·1
Both		4125	3092	75·0	225	7·3	237	7·7	22·1

TABLE 4 SHOWING HISTORY OF SWELLING IN DIFFERENT PARTS OF THE BODY

Families	Upper limbs	Lower limbs	Inguinal glands	Genitalia	Hydroceles	Total
M	4	7	Nil	8	40	59
F ..	8	19	2	Nil	Nil	20
Students .	18*	19	4	71	125	237*

*Out of the students, only two female students gave histories of swelling of the upper limbs.

more number of swelling histories than the males. In the 235 male students histories, 125 were hydroceles and 71 were swellings of the genitalia. No effort was made to explore the disease phenomena as they are much more difficult to interpret than the infection rates.

The infection rate of the staff (10·4 per cent) was higher than the students (7·3 per cent). However, the disease rate of the students (7·7 per cent) was higher than the staff (4·3 per cent). This could be attributed to the age and sex factors.

It might be also of interest to add that the differences in the staff infection and disease rates in the three semicircles (Table 5) were insignificant ($\chi^2=4{\cdot}36$, $P>0{\cdot}10$ for infection rates and $\chi^2=0{\cdot}59$, $P>0{\cdot}50$ for disease rates).

SOCIO-ECONOMIC FACTORS:

The differences between the academic and the nonacademic (ministerial and class IV, Table 5) were statistically significant for infection rates ($\chi^2=22{\cdot}87$, $P<0{\cdot}01$). There was however no difference between the ministerial and the class IV or between the mud and the masonry houses of the class IV. Mahajan *et al.* (*loc. cit.*) reported 2·8, 5·9, 9·0 and

TABLE 5—SHOWING INFECTION AND DISEASE RATES OF STAFF IN THREE SEMICIRCLES AND THREE CATEGORIES OF QUARTERS

	Male					Female					Both	
	No.	Mf.	Infection rate	Disease	Disease rate	No.	Mf.	Infection rate	Disease	Disease rate	Infection rate	Disease rate
Semicircles												
Outer ..	839	85	10·1	45	5·4	579	53	9·1	19	3·2	9·7	4·5
Middle ...	261	30	11·5	12	4·6	122	16	13·1	1	0·8	12·0	2·8
Inner ..	37	7	18·9	2	5·4	8	1	12·5	0	0·0	17·8	4·4
Categories of quarters												
Academic	428	30	7·1	35	8·2	351	20	5·7	19	5·4	6·4	6·9
Ministerial .	139	15	10·7	7	5·0	71	13	18·3	1	1·4	13·3	3·8
Class IV												
With H.C.*	570	77	13·7	--**	·**	287	37	12·9	-**	--**	13·3	--**
Without H.C. .	380	54	14·2	17	4·5	145	24	16·5	0***	0·0***	14·8	3·2

* In class IV, the infection rates for mud (68 persons) and masonry (502 persons) houses were 13·9 per cent and 13·2 per cent respectively. Similarly the respective disease rates were 1·9 per cent and 2·9 per cent.

** In harijan colony (H.C.) situated on the west corner of the township, the information about swellings was not compiled.

*** In the class IV outside the harijan colony ; no female gave history of swellings even on repeated questionning at the time of the visit.

11·7 per cent filaria infection rates in the socio-economic groups earning more than Rs. 300/- p.m., students and nurses, less than Rs. 200/- p.m. and about Rs. 100/- p.m. respectively in the Ahmedabad Medical College campus and its adjoining areas. Duration of stay in the endemic areas was considered more important than the age, the sex or the socio-economic conditions by the authors in the study.

The academic staff in the present study reported through the questionnaire method higher incidence of filarial swellings than the nonacademic (Table 5). Among the nonacademic women, only one in the ministerial group gave the swelling history. The academic staff were perhaps very keen to report and attend the filariasis clinic held with the Professor of Surgery for follow-up of the swellings. Many transitory swellings among the academic staff were seen and treated at the clinic.

PERIOD OF STAY IN BHU TOWNSHIP AND LEVEL OF INFECTION OF AREAS OF ORIGIN:

Out of the total population of 3069 staff and 4125 students, 1846 (60·1 per cent) staff and 3092 (75·0 per cent) of the students were covered by the survey. Out of 4938 covered by the survey 839 (45·4 per cent) of the staff and 251 (8·1 per cent) of the students, i.e., in all 1090 (22·1 per cent) originated from Varanasi. The infection rates either of the staff or of the students of the Varanasi group was 9·2 per cent. Otherwise the reported infection rate for Varanasi was 10·8 per cent (ICMR, 1961).

Period of stay—In the families (Table 6), agewise the Varanasi group had higher infection rates in all the age breakups with the exception of <5 years group than the persons from outside Varanasi. In the Varanasi group, the 5-year impact was both owing to the age and the period of stay factors. With the period of stay, the persons from outside Varanasi had higher infection rates than the Varanasi group with the exception of >15 years. It appeared that in 15 years, the differences in the two groups narrowed down, i.e., the outside group could be treated at par with the Varanasi group.

The rising trends in the families in terms of five year periods were significant for the outside Varanasi group ($x^2=7{\cdot}97$, $P<0{\cdot}05$), the Varanasi group ($x^2=37{\cdot}28$, $P<0{\cdot}001$), and for both combined ($x^2=27{\cdot}25$, $P<0{\cdot}001$). The infection rates for 2618 students with less than or equal to 5 years stay was 6·9 per cent, for 166 students with 5-10 years stay was 8·4 per cent and for 57 students with more than ten years stay was 10·5 per cent. However, the differences were statistically insignificant ($x^2=1{\cdot}50$, $P>0{\cdot}30$). This might be owing to the fact that 2618 out of 2841 students (92·2 per cent) from outside Varanasi group stayed in the township for less than 5 years. As in the case of the families, no trends were palpable when the students data

TABLE 6—SHOWING INFECTION RATES OF FAMILY MEMBERS FROM VARANASI AND OUTSIDE VARANASI ACCORDING TO AGE AND PERIOD OF STAY IN VARANASI

Originating		Age/Period of stay in years											
		−5			−10			−15			>15**		
		No.	Mf.	Rate	No.	Mf.	Rate	No.	Mf.	Rate	No.	Mf.	Rate
Varanasi*		193	1	0·5	201	16	8·0	122	8	6·6	323	52	16·1
Outside	Agewise	24	1	4·2	75	4	5·3	101	6	5·9	807	104	12·9
	***Period of stay	439	37	8·4	198	24	12·1	119	19	16·0	228	32	14·0
Both	Agewise	217	2	0·9	276	20	7·2	223	14	6·3	1130	156	13·8
	***Period of stay	632	38	6·0	399	40	10·0	241	27	11·2	551	84	15·2

* Age and period of stay for persons originating from Varanasi were the same

** No trends were seen when analyses were done in terms 1, 2, 3 or 4 years.

*** For 23 residents, period of stay was not known. Of these 3 were positives.

were analysed in terms of 1, 2, 3 or 4 years period of stay.

The respective infection rates for ≤5 years and >5 years stay for the outside Varanasi families and students were 8·4, 13·7, and 6·9, 9 per cent. The township infection rate of the persons with more than 5 years stay was 12·4 per cent.

IMPACT OF THE LEVEL OF INFECTION OF THE PLACE OF ORIGIN:

In the families, out of 1846, 515 (27·9 per cent) and 492 (26·7 per cent) originated respectively from ≤ 5 per cent and >5 per cent infection level areas and the rest were from Varanasi. The mean (±SD) stay of the persons inside the township from ≤5 per cent areas was 9·5±6·0 and of the persons from >5 per cent areas was 9·9±6·2. The difference in the means was insignificant ($x^2=0{\cdot}11$, $P>0{\cdot}90$). However, the respective infection rates among these groups were 8·3 and 14·6 per cent against 9·2 per cent of the Varanasi group. The differences were significant ($x^2=4{\cdot}83$, $P<0{\cdot}001$). In 3092 students, 1935 (62·6 per cent) and 906 (29·3 per cent) originated respectively from ≤5 and >5 per cent areas and the rest were from Varanasi. The respective infection rates of ≤ 5 and >5 per cent area students were 4·2 and 13·0 per cent against 9·2 per cent of the Varanasi students. The differences were significant ($x^2=7{\cdot}26$, $P<0{\cdot}001$). Thus in the township the infection rates from >5 was 13·6 per cent, from Varanasi was 9·2 per cent and from ≤ 5 was 5·1 per cent.

The differences in the infection and disease rates of the 16 male (as well as all) hostels were highly significant ($x^2=78{\cdot}32$, $P<0{\cdot}001$ for infection rates and $x^2=121{\cdot}00$, $P<0{\cdot}001$ for disease rates). The differences could be explained on the basis of the percentage population of the students in each hostel from ≤ 5 per cent or >5 per cent home district infection level areas (Tables 7, 8, and Fig. 2). In spite of the differences found between the infection rates of students staying uptill 5 years and for more than 5 years (previously discussed), the percentage distribution of students with more than 5 years stay in various hostels (Table 7) did not show any trend with hostelwise infection rates of the series.

As such it could be presumed that in the aggregated BHU community, the levels of infection of the areas of origin (both for families and students) was the most important contributory factor followed by the period of stay in terms of 5 years intervals (definitely for the families) in the area.

In spite of the most scrupulous checking of all positive slides with special emphasis on the examinations of the slides of the residents of *Brugia malayi* endemic areas, not a single slide was found positive for *Brugia malayi* infection. Double infections were reported in the literature (Jordon, *loc. cit.*).

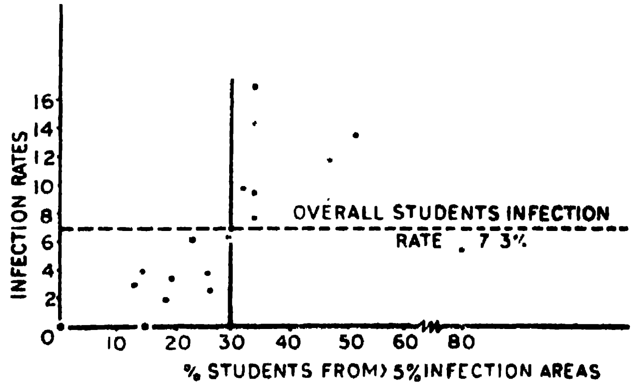

FIG. 2

TABLE 7 — SHOWING HOSTELWISE INFECTION RATES ACCORDING TO THE PERCENTAGE COVERED FROM > 5 PER CENT INFECTIONS AREAS AND PERIOD OF STAY WITH > 5 YEARS

Hostels	Infection rate	Per cent covered from areas with > 5 per cent infection rate	Per cent covered with a period of stay > 5 years at Varanasi
ITC	5·4	80·8	3·8
Vivekanand	1·9	18·4	8·3
S. C. Dey	0·0	13·6	1·1
Limbdi	2·8	12·7	2·0
Rajputana	3·7	26·2	1·5
Dhanrajgiri	3·2	18·8	5·5
Morvi	6·2	23·1	5·1
Ramkrishna	3·8	13·8	6·9
A. N. Gurtu	9·9	32·0	1·6
Bhagwan Dass	16·1	34·4	44·1
Radhakrishna	9·6	36·3	0·8
Ayer	7·7	36·5	9·4
Broacha	11·8	47·2	4·0
Birla	13·6	54·1	10·0
Ruiya	6·4	29·6	1·9
International	0·0	0·0	0·0
Girls	2·5	26·1	9·6
Total (boys)	7·7	32·5	7·7
Grand total (boys and girls)	7·3	31·9	7·8

TABLE 8 SHOWING DISTRIBUTION OF HOSTELS ACCORDING TO INFECTION RATE AND PERCENTAGE OF STUDENTS FROM > 5 PER CENT INFECTION LEVEL AREAS*

Hostel infection rate	Per cent of students from > 5 per cent areas		
	<32 per cent	⩾ 32 per cent	Total
⩽ 5 per cent	8	0	8
>5 per cent	2	7	9
Total hostels	10	7	17

* 31·9 per cent students from all the hostels were from > 5 per cent infection level areas. As such the hostels were divided into two groups, i.e., with < 32 per cent or ⩾ 32 per cent students population from > 5 per cent infection level areas. Further each hostel was categorised according to ⩽ 5 per cent or > 5 per cent infection level among student population as detected in the present survey.

SUMMARY

In the aggregated community, the levels of infection of the areas of origin (both for families and students) followed by the duration of stay in terms of 5 years period (definitely for the families) were considered the most important factors in the epidemiology of filariasis. Further the present series (families), the differences between the Varanasi group and the outside Varanasi group seemed to narrow down in 15 years.

The highly significant differences ($P<0{\cdot}001$) in the human rates of the residential hostels could also be explained on the basis of the hostelwise distribution of the students according to infection levels of their respective home districts.

Further on the basis of the present studies, it could be recommended that persons from high endemic areas entering low endemic or nonendemic areas should be examined for night smears at entry and treated if positive. This is perhaps all the more important as the liberal treatment or even public health facilities in the BHU did not seem to be very effective in checking the transmission of the infection.

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2

Coronary Artery Disease in the Aged

K. NATHANI*

[Received for publication January 6, 1971]

Disease in the aged as contrasted to the young is characterised by multiplicity, duplicity and chronicity (Stieglitz, 1949).

Less frequency and less severity of pain, sudden development of dyspnoea, sudden deaths, higher incidence of demonstrable thrombus, greater tendency of myocardial infarction to develop after shock, development of congestive heart failure without preceding history and higher incidence of cardiac arrhythmia and heart block, are some of the features of coronary heart disease in the aged (Stieglitz, *loc. cit.*; Smith, 1955; Hobson, 1956).

Postmortem study (Belford and Caird, 1956; Rose and Wilson, 1959) and postmortem coronary angiography (Weitzman, 1964) revealed that increased frequency of unexplained heart failure in aged persons is due to ischaemic heart disease. Fulton (1964) by studying postmortem coronary angiography of hearts of aged persons found that blockage of both coronary arteries are needed to produce myocardial infarction and subendocardial collateral circulation is the modifying factor.

The present study was undertaken to find out differences in the clinical presentation of coronary artery disease in the geriatric patients as contrasted to the young.

MATERIAL AND METHOD

During the period February 1967 to June 1968, geriatric patients (i.e., aged 60 years and above) admitted in the different wards of King George's Medical College, Lucknow, were studied. 39 cases had evidence of coronary artery disease. These patients are designated as group I (GI).

During the same period, 20 patients of coronary artery disease aged 40 years to 59 years designated as group II (GII) were also studied so as to compare findings of geriatric group (GI) with this younger group (GII).

OBSERVATIONS

Mean age and sex incidence—Mean age and sex incidence in GI and GII patients are shown in Table 1. The males out numbered the females.

23 (59 per cent) out of 39 GI patients and 10 (50 per cent) out of 20 GII patients had positive history of past attacks of coronary artery disease.

TABLE 1—SHOWING MEAN AGE AND SEX INCIDENCE IN GI AND GII CASES

Group	No. of cases	Mean age (in years)	Male No. of cases	Male Per cent	Female No. of cases	Female Per cent
I	39	64·3	34	87·2	5	12·8
II	20	48·2	18	90·0	2	10·0

It is significant that 16 patients (41 per cent) of GI patients had a clean history till past 60 years, when they got first attack pointing to coronary artery disease.

Analysis of type of coronary artery disease is shown in Table 2.

TABLE 2—SHOWING TYPE OF CORONARY ARTERY DISEASE

Type of coronary heart disease	GI No. of cases	GI Per cent	GII No. of cases	GII Per cent
Angina .	3	7·7	2	10
Pre-infarctional ...	7	17·9	2	10
Myocardial infarction	29	74·4	16	80

The relative incidence of the three clinical syndromes of coronary artery disease shows no significant difference in the two age groups.

Electrocardiographic findings of both groups are shown in Table 3.

TABLE 3—SHOWING ELECTROCARDIOGRAPHIC DIAGNOSIS IN BOTH GROUPS

ECG findings	GI	GII
Acute myocardial infarction		
Anterior . .	5	3
Antero-septal .	3	1
Posterior . ..	1	2
Antero-lateral	—	3
With left bundle branch block . .	1	—
Septal and old posterior ..	1	—
Old myocardial infarction		
Anterior	4	1
Anterior and posterior	1	—
Inferior wall	—	1
Posterior wall ..	—	1
Posterior with left ventricular hypertrophy	2	1
Inferior with recent septal infarction	1	—
Ventricular hypertrophy		
Right and left ventricular hypertrophy	1	—
Left ventricular hypretrophy ...	2	—
With old myocardial infarction ...	—	1
Normal	2	4

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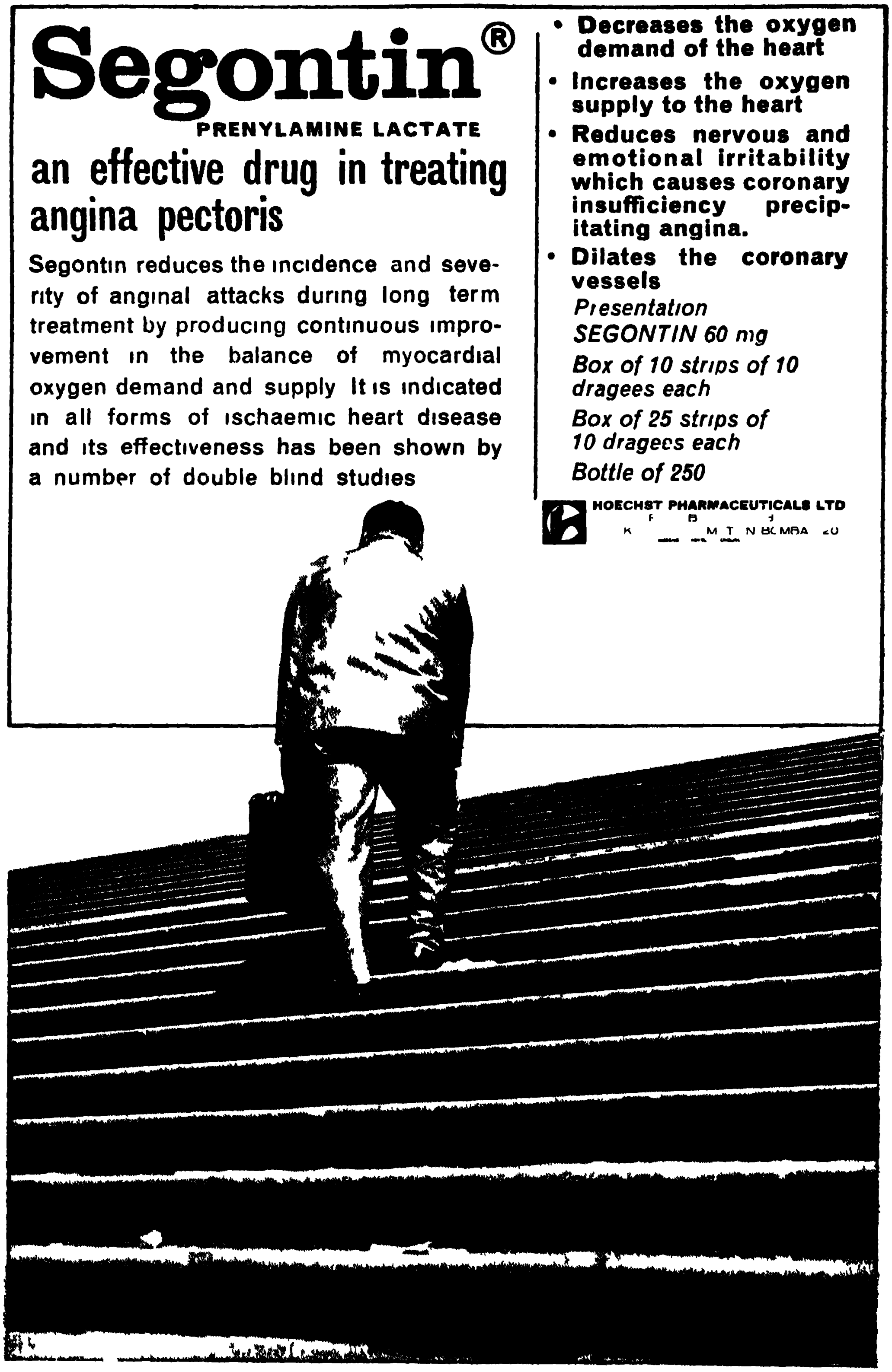

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16 (41 per cent) patients of GI and 2 (10 per cent) patients of GII developed various types of conduction defects and arrhythmias (Table 4).

TABLE 4—SHOWING CONDUCTION DEFECTS AND ARRHYTHMIAS

Type of conduction defect and arrhythmia	No. of cases	
	GI	GII
Complete heart block ...	7	0
Right bundle branch lock	3	0
Left bundle branch block	1	1
Paroxysmal tachycardia (precipitating angina) ...	1	0
Auricular fibrillation	1	1
Ventricular extrasystole .	2	0
Ventricular fibrillation .	1	0

Pain as the first symptom of attack was less frequent in GI patients (21 cases ; 53·8 per cent) as compared to that of GII patients (18 cases ; 90 per cent).

Atypical angina was present in a small percentage in both groups, viz, a few had pain without radiation to arm or pain in arm or pain in the epigastrium only.

The severity of pain is hard to judge. However, here the observer being the same person the error is expected to be minimal. Pain was less disturbing and less severe in GI patients than in GII (Table 5).

TABLE 5—SHOWING SEVERITY OF ANGINAL PAIN

Group	Number of cases having pain	Mild		Moderate		Severe	
		No. of cases	Per cent	No. of cases	Per cent	No. of cases	Per cent
GI	21	6	29	7	33	8	38
GII	18	3	17	3	17	12	66

The basic symptom combination and signs of this episodic illness, viz., coronary artery disease and its natural course are well documented. The occurrence of an episode in atherosclerotic age, of pain, dyspnoea, and shock with an ECG or SGOT estimation determines the diagnosis and makes it easy when other manifestations especially syncope, cardiac failure, cardiac arrhythmia and pulmonic, neurogenic or gastro-intestinal forms are added to the basic triad. But when the latter, i.e., mostly noncardiac forms are the presenting features in geriatric patients, difficulty arises.

Duration of illness on admission is shown in Table 6.

TABLE 6—SHOWING DURATION OF ILLNESS ON ADMISSION

Duration of illness on admission	GI		GII	
	No. of cases	Per cent	No. of cases	Per cent
Within 24 hours .	4	10·25	6	30·0
Within 1 week .	7	17·95	2	10·0
Within 1 month ..	3	7·70	0	0·0
Within 1 year ...	8	20·50	5	25·0
More than 1 year .	17	43·60	7	35·0

As expected the morbidity due to the three coronary syndrome was more chronic in GI patients In 43·60 per cent it was over a year.

The mortality and survival figures from first 48 hours to first year is shown in Table 7. There seems to be no overall mortality difference in the two groups.

TABLE 7—SHOWING MORTALITY AND SURVIVAL UP TO ONE YEAR

	GI		GII	
	No. of cases	Per cent	No. of cases	Per cent
Deaths	12		7	
First 48 hours	3	25	4	56
First week	5	41	1	14
First month	3	25	1	14
First year	1	9	1	14
Survivors (one year)	27		13	65

Complications—Qualitatively the same set of complications are met with in both GI and GII cases of myocardial infarction in the acute, healing and healed stages. The series was not large to make out significance of incidences of complications and their sub-types.

12 (40 per cent) patients in GI had aberrant, atypical, monosymptomatic clues to diagnosis which were common. The remaining 60 per cent presented either with two, three or more of the manifestations or presented with monosymptomatic angina or cardiac asthma which are well known and well recognised clues to diagnosis of coronary artery disease. The geriatrician therefore must be aware of the monosymptomatic clues.

In GII it was striking that other monosymptomatic forms, except angina, did not occur.

However, two points need emphasis (i) it may be noted that whilst 7 out of 30 GI patients with coronary thrombosis presented initially as cases of chronic congestive heart failure, not one of 16 of GII patients came with congestive heart failure (Table 8) as the primary and sole monosymptomatic clinical presentation. Some of these were hypertensive and had coronary artery disease, (ii) it is significant to note that GI patients had a fairly high incidence of conduction defects and arrhythmias as contrasted to GII patients (Table 4).

TABLE 8—SHOWING TYPICAL/ATYPICAL PRESENTATION

	GI No. of cases	GII No. of cases
Anginal forms	3	4
Non-anginal forms		
Dyspnoeic	2	0
Pulmonic	1	0
Syncopal	2	0
Gastro-intestinal . . .	1	0
Sudoral . .	1	0
Neurogenic	1	0
Chronic congestive heart failure	7	0

The geriatric dictum of multiplicity and duplicity of clinical picture in the aged is obvious from Table 8.

DISCUSSION

It may be necessary to discuss that on what age patient can be called geriat or aged. So far no age has been fixed. Different workers have taken different age for the work they have done on geriatric patients, e.g., 70 years (McKlewn, 1963), 68 years (Kutz and Eloia, 1965), 65 years (Smith, 1950; Belford and Caird, *loc. cit.*), 60 years (Howell, 1953; Smith, 1955; Hobson, 1956). Subjects of 60 years and above were only taken as geriatric patients as a number of workers have advocated the same.

Multiplicity in the geriatric coronary cases is evidenced by additional presence of pathology elsewhere, namely cerebrovascular or renal.

Duplicity in the geriatric coronary case is exemplified by the atypical clinical presentations (Table 8).

Chronicity is evidenced by the longer duration of coronary artery disease in geriatric (GI) as compared to GII, as counted from the first clinical episode of coronary artery disease (Tables 6, 7). Thus Stieglitz's dictions (*loc. cit.*) are applicable to geriatric coronary disease as well.

The physician's responsibility in making a correct diagnosis is great in all fields of medicine including geriatrics. Nonanginal monosymptomatic forms may mislead the clinician and he may completely miss the diagnosis of coronary artery disease in as many as 40 per cent. It is necessary that the geriatric physician must learn to anticipate and diagnose coronary artery disease in the absence of angina and frequently by a clue which is extra-cardiac.

Atypical myocardial infarction is common in the aged. Sarma *et al.* (1965) reported atypical presentation of myocardial infarction at all ages including geriatric group. Papp (1952) and Paton (1957) observed the same relationship of age to atypical presentation.

SUMMARY

59 cases of coronary artery disease (39 geriatric cases) admitted in medical wards of King George's Hospital, were studied clinically.

It has been observed that multiplicity, duplicity and chronicity are the hall marks of the geriatric coronary artery disease case.

ACKNOWLEDGMENT

I find words inadequate to experss my thanks to my respected teacher Professor Kul Bhoshan Kunwar, who with his able guidance made the completion of this work possible. To Professor S. N. Chakravarty, I express my deep sense of gratitude for the interest he took in my work.

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3

Tetanus—A Method of Scoring to Determine the Prognosis †

M. B. RENUKARYA*

[Received for publication November 23, 1970]

The recent trend in the management of tetanus is to use smaller doses of A.T.S. or to discard it altogether (Barua, 1963 ; Vaishnava *et al.*, 1966). The various factors which favourably or adversely affect the course and thereby the prognosis of the disease must be determined and due regard should be given to these factors while assessing the usefulness of any treatment schedule. Keeping this in view, this clinical study of tetanus was undertaken. On analysis of the findings, it was possible to find out a method of scoring which helps in determining the prognosis quite early in the course of the disease.

MATERIAL

All cases of tetanus admitted to infectious diseases wards of Civil Hospital, Belgaum between 15-9-1969 and 14-9-1970 came up for study. All these patients were given 20 thousand units of A.T.S. on admission and were sedated with paraldehyde and chlorpromazine. Crystalline penicillin in suitable doses was the antibiotic used. A detailed history and examination was done as per a proforma and they were followed till death or discharge.

OBSERVATIONS

Incidence—The admissions to Civil Hospital during this period totalled 17,831 and the number of cases of tetanus was 125, giving an incidence of 0·7 per cent of all admissions. This compares with other reports of 0·95 per cent to 1·39 per cent (Vakil, 1964). The deaths in the hospital during the above period totalled 948 and deaths due to tetanus 55, thus forming 5·8 per cent of all deaths. This is less than other reports—11 per cent (Vakil, *loc. cit.*), 16 per cent (Vaishnava *et al., loc. cit.*). The mortality rate of tetanus is 44 per cent and compares well with other reports—46 per cent (Vaishnava *et al., loc. cit.*), 29·6 per cent (Jaffari, 1964), 32·7 per cent (Vakil, *loc. cit.*) and 42·7 per cent (Patel and Joag, 1959).

Age and sex—This is shown in Table 1.

TABLE 1—SHOWING AGE AND SEX DISTRIBUTION

Age group (year)	Male	Female	Total
Neonatal	2	1	3
1 ...	2	1	3
1—5	12	8	20
6—10 ..	7	10	17
11—20 ...	22	5	27
21—30 .	12	10	22
31—40	6	9	15
41—50 .	5	2	7
50 ...	8	3	11
Total ...	76	49	125

The majority of cases, i.e., 70 per cent belong to the age group 1-30 years (comprising 30 per cent in 1-10 years, 22 per cent in 11-20 years, 18 per cent in 21-30 years), the age group most susceptible to injury and hence infection. Overall sex ratio is M:F=3:2.

In the analysis of recovery and death as compared to age and sex it is seen that the mortality is high in the very young i.e., less than 10 years (58 per cent) and very old i.e., more than 50 years (64 per cent). In addition, the mortality is also high in women of child bearing age i.e., 21-40 years (68 per cent) as compared to men of the same age group (44 per cent). This is probably because of the lowered general resistance in this group.

Occupation Table 2 shows the occupation and incidence of tetanus.

TABLE 2 SHOWING OCCUPATION AND INCIDENCE OF TETANUS

Occupation	% incidence
Agriculture labour	42
Agriculture landlord	3
Cooli (Town)	14
Misc. (Town) e.g., clerks, business, etc.	11
Housewife .	12
Neonatal .	3
Children	40

Agriculture labour formed 42 per cent and children 40 per cent of all cases. These are the population at high risk of injury and infection. The death rate does not show any preference.

Month and season—Table 3 shows the month and seasonwise incidence of tetanus.

Since only one year has been under study, it is difficult to comment. However in general, both the cases and deaths are more or less uniformly distributed over the months especially so when considered seasonwise.

Site of infection—This is shown in Table 4.

All sites find a representation in the series The commonest site is the leg and foot (45 per cent),

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† Based on a paper read at 37th Mysore State Medical Conference at Gulbarga in October 1970

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TABLE 3—SHOWING MONTH AND SEASONWISE INCIDENCE AND DEATH IN TETANUS

Month	No. of cases	Deaths
January	13	5
February	17	6
March	12	3
April	10	3
May	7	5
June	15	9
July	7	2
August	13	3
September	8	4
October	8	5
November	6	3
December	9	6
Season		
Summer (MAM)	29	11
Rainy (JJA)	35	14
Autumn (SON)	22	14
Winter (DJF)	39	17

TABLE 4—SHOWING THE INCIDENCE OF SITE OF INFECTION AND DEATH

Site of infection	No. of cases	Deaths
Head and neck	19	8
Arm and shoulder	1	1
Forearm and hand	20	8
Chest and abdomen	7	6
Thigh and hip	2	1
Leg and foot	56	20
Umbilicus	3	1
Uterus	4	4
Undetected	13	6

the part of the body most exposed to injury. Next is forearm and hand (16 per cent) and head and neck (16 per cent).

At first sight, it appears as if the death rate is high when the site of infection is chest and abdomen. But this is a false surmise as these comprise 3 postoperative and 3 burns cases which carry a high mortality rate. The death rate, when the uterus is the site of infection, is 100 per cent and it is also high when umbilicus is the site (out of 3, 1 died and 1 discharged against medical advice). Other workers have also recorded similar high death rates in neonatal tetanus, 86 per cent (Bhatt and Anwikar, 1962) and 80 per cent (Vakil, *loc. cit.*).

The undetected cases amount to 10 per cent of all cases and though this is a sizeable number, it does not vitiate the results as the death rate in this group (46 per cent) is nearly the same as average death rate (44 per cent).

Portal of entry—This is shown in Table 5.

TABLE 5—SHOWING INCIDENCE OF THE SOURCE AND PORTAL OF ENTRY OF INFECTION AND DEATH

	No. of cases	Deaths
Trauma	87	36
(a) Abrasions, superficial cuts	33	7
(b) Slight penetrating wounds (thorns, nails, etc.)	29	14
(minor injuries)	62	21
(c) Moderate wounds	19	10
(d) Deep lacerated crushed injuries	6	5
Postoperative	3	3
Sepsis	17	7
(a) Boils, etc.	3	—
(b) Otogenic	5	1
(c) Umbilical (neonatal)	3	1
(d) Uterine (puerperal, abortive)	4	4
(e) Vaccination	2	1
Burns	4	3
Dog bite	1	—
Undetected	13	6

The portal of entry means the nature of wound or infection. It is used to mean the source and not the site of infection. Trauma forms 75 per cent of cases and 50 per cent cases are due to minor trauma. Primary sepsis without prior trauma contributed to 14 per cent of cases and includes all types of sepsis as seen in Table 5.

The death rate was found to be high (80 per cent) in severe, crushed or lacerated wounds; 100 per cent in postoperative cases and 75 per cent in burns.

Presence of infection—Table 6 shows the incidence of infection and death.

TABLE 6—SHOWING THE INCIDENCE OF PRESENCE OF INFECTION AND DEATH

	No. of cases	Deaths
No obvious infection at any time	47	19
Infection now healed	28	3
Infection now present	46	30
Infection right from beginning	4	3

No obvious infection was noticed at any time in 42 per cent of cases. We can surmise from this that trauma, however trivial it may be and hence ignored, can become infected and lead to tetanus. Death rate was high if infection was present at the time of admission (65 per cent) or right from the beginning (75 per cent).

Wound toilette—Attention to wound and cleaning was done at home in 16 cases only and by a doctor in 21 cases with 10 deaths. As these 10 deaths included 3 postoperative, 4 puerperal and 1 neonatal cases all carrying 100 per cent mortality rate, it would not be right, to infer that wound toilette by a doctor is valueless in the prevention of tetanus.

Incubation period—Table 7 shows the incubation period and incidence of death.

TABLE 7—SHOWING THE INCUBATION PERIOD AND INCIDENCE OF DEATH

Incubation period (days)	No. of cases	Deaths
0—2	6	2
3—5	12	9
6—8	24	19
9—11	15	9
12—14	15	3
15—20	19	2
21—30	10	1
31—60	9	4
60	2	2
Cannot be recorded	13	6

The incubation period is highly variable from less than 2 days to more than 60 days. In 43 per cent cases it is 6-14 days and in another 23 per cent it is 15-30 days. Contrary to commonly held views, if the site of infection is head and neck the incubation period is not less; out of 19 cases, it was 0-2 days in 3, 2-4 days in 2, 4-6 days in 4, 6-8 days in 1, 8-10 days in 3, 11-14 days in 3 and more than 14 days in 3.

Death rate is high when the incubation period is short, 68 per cent if less than 11 days and 22 per cent if more than 11 days.

First symptom—Table 8 shows the first symptom and the incidence of death.

Lockjaw is a characteristic and diagnostic symptom and sign. It was the first symptom in 69 per cent of cases and subsequently occurred in all cases except two which were investigated in detail to exclude other causes. Dysphagia as a first symptom was associated with a high death rate of 67 per cent, probably because of associated dangers of aspiration, asphyxia, etc.

TABLE 8—SHOWING THE INCIDENCE OF FIRST SYMPTOM AND DEATH

Symptom	No. of cases	Deaths
Lock jaw	86	32
Dysphagia	9	6
Neck stiffness	21	11
Back stiffness	5	1
Limb stiffness	2	0
General spasm	12	5

L-S period—The term means lockjaw-spasm period or the period of onset or the période from first symptom to the generalised spasms. The spasm was found to occur most often within 72 hours (69 per cent) but may be delayed to more than 120 hours. The mortality rate was higher with shorter L-S periods—56 per cent when less than 48 hours, 6 per cent when more than 72 hours (Table 9).

TABLE 9 SHOWING THE INCIDENCE OF L-S PERIOD (PERIOD OF ONSET) AND DEATH

L-S period (hours)	No. of cases	Deaths
24	34	17
24—48	38	23
48—72	17	9
72—96	4	1
96—120	6	0
120	8	0
Not recorded	6	3
No spasm	12	2

Severity 9·5 per cent of cases were mild i.e., no generalised spasm was present; 54·5 per cent of cases were moderate i.e., mild type of generalised spasm present; 36 per cent of cases were severe i.e., moderate to severe generalised spasms present (Table 10). It is to be noted that death occurred even in mild cases but death rate was high in severe cases (67 per cent).

TABLE 10—SHOWING THE INCIDENCE OF SEVERITY, COMPLICATION AND DEATHS

	No. of cases	Deaths
Severity		
(1) Mild (no spasm)	12	2
(2) Moderate	68	23
(3) Severe	45	30
Complications		
(1) Hyperpyrexia	15	8
(2) Aspiration pneumonia	12	8
(3) Injection abscess	1	—

The complications noted were hyperpyrexia in 15 cases with 8 deaths and aspiration pneumonia in 12 cases with 8 deaths. Surprisingly only one case of injection abscess was seen in spite of numerous injections administered to these patients. No case of serum reaction was seen.

Duration of illness and outcome—8 per cent of the patients were discharged (Table 11) against medical advice (AMA); 44 per cent died and of these 95 per cent died within 7 days. Recovery rate was 56 per cent and it was equally distributed among 4 weeks. If a person lived for one week, the chances of his recovery were very good as only 3 out of 53 cases alive beyond one week died.

There was one case of recurrent tetanus occurring 2½ months later and death occurred during the second attack. Similar reports are found in literature (Bhatt and Anwikar, *loc. cit.*). Cause is not known.

TABLE 11—SHOWING THE DURATION OF ILLNESS AND PROGNOSIS

	No. of cases	Deaths
1. Discharged against medical advice		10 (8%)
2. Death		55 (44%)
1-7 days	52	
4—14 days	2	
11-14 days	1	
3. Recovery		60 (48%)
1-7 days	10	
8—10 days	10	
11-14 days	15	
15—20 days	11	
21—30 days	11	
30 days	3	

SCORING TO DETERMINE THE PROGNOSIS

The results of the study more or less confirm the results of previous studies (Vaishnava *et al., loc. cit.*; Jaffari, *loc. cit.*; Vakil, *loc. cit.*; Barua 1961 and 1963; Bhatt and Anwikar, *loc. cit.*). Some factors indicate a bad prognosis and are associated with a death rate varying from 60 per cent to 100 per cent. But there are a few cases who live in spite of such association with a bad prognostic sign. Hence, it was thought that a combination of such factors would be better indicator of bad prognosis. Based on this idea, a method of scoring, developed and tested in this small series gave consistent results.

The method is to score one point for each one of the following which indicate bad prognosis:

(1) Age and sex : Less than 10 years, more than 50 years; women of age group 21-40 years. (2) Portal of entry : Deep wounds, burns, postoperative cases, umbilical and uterine sepsis. (3) Infection still present on admission. (4) Incubation period less than 11 days. (5) L-S period less than 48 hours. (6) Severe degree.

Results of scoring among 125 cases under study is shown in Table 12. It is observed that 4, 5 and 6 scorers invariably die whereas 0, 1 and 2 scorers invariably live. Among 3 scorers, three-fifths die and only two-fifths survive.

TABLE 12—SHOWING THE RESULTS OF SCORING

Score	Recovery	Death	AMA
6	—	2	—
5	—	12	—
4	—	15	4
3	14	23	4
2	22	3	2
1	18	—	—
0	6	—	—

Any treatment schedule must take this into cognisance. It must aim to produce recovery in all 3 scorers and to some extent in 4 scorers also. If by chance, the group under study consists mainly of 4-5-6 scorers, the treatment would be evaluated as a poor one and *vice versa.* Hence, it is hoped that this method of scoring would be of special value.

SUMMARY

125 cases of tetanus have been studied.

Various factors, favourably and adversely affecting the course and prognosis of the disease have been analysed.

A method of scoring based on the adverse prognostic factors has been found.

This scoring, tested in this series of 125 cases, yielded consistent results.

ACKNOWLEDGMENT

I thank Dr. B. S. Jirge, Dean, Jawaharlal Nehru Medical College, Belgaum, for his encouragement throughout the study. I am also grateful to the District Surgeon and Heads of the Units in Civil Hospital, Belgaum for kindly permitting me to use the material obtained from patients under their care.

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4

Cauda Equina Syndrome—A Clinical Study

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Cauda equina syndrome is a symptom complex occurring due to a lesion of the nerve roots below the level of termination of the spinal cord. Such a lesion leads to a flaccid type of paralysis. Jolly *et al.* (1961), Khosla and Mehrotra (1965) and Chaudhary *et al.* (1968) have reported incidence of cauda equina syndrome to be 10·7, 18·7 and 7·7 per cent respectively in cases of paraplegia. The present study has been carried out to elucidate the aetiological factors and to discuss the clinical features of such cases.

MATERIAL AND METHOD

Sixty-three cases of cauda equina syndrome admitted during the years 1961 to 1969, in Rajendra Hospital, Patiala, were studied. In addition to routine examinations and investigations, cerebrospinal fluid examination, skiagram of the lumbosacral region and the blood serological tests were carried out. Myelography was done in 10 cases and laminectomy was performed in 5.

OBSERVATIONS AND COMMENTS

Age and sex incidence—The age and sex incidence is shown in Table 1. The maximum number of cases were between 41-50 years (18 cases).

TABLE 1—SHOWING AGE GROUPS AND SEX DISTRIBUTION

Age group (years)	Male	Female	Total
10—20	6	1	7
21—30	8	6	14
31—40	7	2	9
41—50	15	3	18
51—60	6	-	6
61—70	6	—	6
71—80	2	—	2
81—90	1	—	1
Total	51	12	63

Of the clinical features (Table 2) root pains was an important symptom of the disease. In 12 cases it preceded far before the onset of physical signs. The pain most of the time started from the back and radiated along the back of the thigh up to the heels. Motor weakness, another important symptom, was present in all the 63 cases. Most of the time weakness was asymmetrical and the site of the wasting varied depending upon the roots involved. Muscles below the knee were more frequently involved than the glutei and hamstrings. Bladder involvement was in the form of incontinence and hesitancy.

TABLE 2—SHOWING PRESENTING SYMPTOMS AND SIGNS

	No. of cases	Percentage
Symptoms		
Root pains	43	68·2
Motor weakness	63	100
Bladder involvement	30	47·6
Signs		
Sensory loss	37	58·7
(a) Root type	16	
(b) Saddle shaped	12	
(c) All roots	9	
Absent ankle jerks	63	100
Planter response		
Flexor	36	57·1
Non-elicitable	27	42·9

The sensory loss was always of root type. The sacral roots being commonly involved. The ankle jerks were lost in all the 63 cases and this was the hall mark sign in cauda equina lesion. Loss of both ankle and knee jerks was noted only in 40 cases. Trophic symptoms and signs and bed sores were present in 6 cases. Table 3 shows the results of the various investigations done. X-ray of the lumbosacral spine both straight and lateral views were very helpful.

TABLE 3—SHOWING THE RESULTS OF VARIOUS INVESTIGATION

Investigations	No. of cases
Increased proteins in CSF	23
Positive serological tests for syphilis	5
Radiological findings	
(a) Nil fiindings	16
(b) Traumatic spondylolithiasis	1
(c) Compression fracture	8
(d) Caries spine	7
(e) Secondaries spine	7
(f) Haemangioma	2
(g) Myeloma deposits	4
(h) Prolapsed disc	12
(i) Osteoarthritic changes	6
(j) Evidence of block on myelography	8

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The maximum recorded increase of proteins in the cerebrospinal fluid was 450 mg. per cent. Myelography was done in 10 cases revealing a block in 8. Out of these 2 were suspected to be suffering from arachnoiditis (1 was proved by laminectomy), one was suspected haemangioma (proved by laminectomy), 3 were suspected to be suffering from primary tumour and one from secondary deposits.

Laminectomy—This was a useful procedure not only for the treatment of the underlying disease but also as a diagnostic aid in cases where no diagnosis could be made on routine investigations but the CSF changes showed evidence of a block. Laminectomy was possible in only 5 of our cases. Out of these one had haemangioma of the vertebral body, one had arachnoiditis, one had caries spine, one had secondaries spine and one turined out to be a case of epidural abscess.

The most frequent aetiological factor encountered in our series was neoplastic process in one form or the other (23 cases, 36·5 per cent). 7 cases had typical osteolytic secondaries in the lumbosacral vertebrae. These cases on further investigations were found to be cases of carcinoma of the prostate. 12 of the cases were suspected to be suffering from primary tumours. 2 cases of haemangioma were diagnosed because of a lace like pattern on the vertebrae on x-ray.

Multiple myeloma was proved on bone marrow aspiration showing myeloma cells in 4 cases. These patients had osteoporosis in the spine and 2 had compression fracture of the vertebrae. The result of the haematological investigations like raised erythrocyte sedimentation rate and reversal of albumin-globulin ratio were contributory factors. All of the cases had punched out areas in the x-ray of the skull and ribs.

Another frequent cause of cauda equina lesion in the present series was lumbar disc lesion (28·6 per cent). The history was suggestive of prolapsed disc and clinical evidence of irritation of S_1 root in 12 cases. X-ray of the spine showed invariable narrowing of the intervetebral disc in these cases and the history in these patients was classically spread over a long time and there were remissions and relapses in the course of illness. Generalised osteoarthritic changes in spine were present in 6 cases. All these cases were above the age of 60 years and there was no clue to any other disease on investigations. Some of these cases might have been due to vascular insufficiency as suggested by Jolly *et al.* (1959).

Cauda equina lesion were due to infection of one type or the other in 15 cases (23·8 per cent). Changes classical of caries spine on x-ray were present in 7 cases out of which one was operated. Positive serology was present in 5 cases and these were probably due to syphilitic pachymeningitis. 2 cases were due to arachnoiditis. These cases gave history of some trauma in the back with symptoms and signs of cauda equina lesion. Myelography showed beeding pattern. The diagnosis was confirmed by laminectomy in one case. One case suffered from epidural abscess following a spinal anaesthesia (proved on laminectomy).

Traumatic fracture dislocation was the cause of the cauda equina lesion in 6 cases with a history of direct fall on the sacral region in each. One case had spondylolithiasis diagnosed on x-ray of the spine.

SUMMARY

63 cases of cauda equina syndrome are reported.

The diagnosis of cauda equina lesion can be made by the presence of root pains, asymmetrical motor weakness with absence of ankle jerks, root type of sensory loss and some involvement of the sphincter. The final diagnosis can be reached by the careful analysis of the history, serological examination, radiological examination of the CSF, myelography and laminectomy.

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5

Isolation of Inaba *V. cholerae* (Classical Type) in Rewa (Madhya Pradesh)

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Cholera, in epidemic form has been reported from different parts of our country and is now accepted to be endemic in many of them but there is no published report from Madhya Pradesh so

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far though cases suffering from mild cholera caused by *V. cholerae* El Tor type were discovered in Indore region of M.P. in 1969 (Monga, 1970). Similarly cases of severe cholera caused by *V. cholerae* Inaba classical type were discovered in epidemic form in Raigarh and Raipur districts of this State.

There was a small epidemic of cholera in Rewa and its surrounding areas during the last summer, starting from the month of June 1970. The stool samples of these cases were investigated in our department for *V. cholerae* and other enteric pathogens. Isolation of *V. cholerae* Inaba phage type I from some of them has prompted us to report these findings.

MATERIAL AND METHOD

Samples of stool collected from 100 patients, suffering from cholera like manifestations have been bacteriologically investigated. These cases consisted of 55 females and 45 males, all except 3 children, were adults. Most of these patients belonged to Rewa and were admitted into the isolation ward of our hospital. Similar cases occurred in Panna, Satna and Chhatarpur districts of this region and a few samples of stool from these cases were received for investigation. Rectal swabs and stool samples were collected in V. R. fluid and were cultured within 12 hours of their collection, except which were received by post from distant places. The established bacteriological procedures for isolation of *V. cholerae* and other enteric pathogens were employed.

V. cholerae were tested serologically with monospecific antisera and also for their haemolytic character and V P test. Phage typing and polymixin sensitivity tests were done in the Cholera Research Centre, Calcutta.

RESULTS

The incidence of different organisms isolated is shown in Table 1.

TABLE 1 - SHOWING THE INCIDENCE OF DIFFERENT ORGANISMS ISOLATED FROM 100 SAMPLES OF STOOL

Organisms	No. of cases
Vibrio cholerae Inaba (classical type). phage I	19
Proteus group	12
Pseudomonas aeruginosa	14
Shigella like organisms	17
E. coli	38

All the strains of *V. cholerae* were biochemically and serologically identical. They gave a negative V P reaction and were nonhaemolytic on testing with 1 per cent suspension of sheep red blood cells and agglutinated with monospecific serum of *Vibrio cholerae* Inaba. These strains belonged to phage type I and were sensitive to polymixin B.

COMMENTS

Cholera, an important epidemic disease is reported to occur in different parts of our country and its causative agent has been considered to be undergoing a change of its biotype. Since 1964, *V. cholerae* El Tor has been reported from many parts of our country although pockets of *V. cholerae* classical type have been reported to exist in Assam (Saha *et al.*, 1970), Calcutta, and Agartala in Tripura (Neogy and Chatterjee, 1970) and other parts of India. In this part of Madhya Pradesh cholera like cases started reporting in the hospital in June 1970 and their number increased fast in the months of July and August as assessed from the number of patients admitted. *V. cholerae* Inaba (classical type) has been isolated from 19 per cent of the cases investigated, these strains were nonhaemolytic, polymixin sensitive and belonged to phage type 1. Such cases still continue to appear occasionally. These findings suggest that cases of cholera occur in Madhya Pradesh.

SUMMARY

One hundred cases of acute gastro-enteritis in Rewa and its adjoining districts in Madhya Pradesh, were bacteriologically investigated. Nineteen cases of *Vibrio cholerae* Inaba (classical type), phage type I, were isolated.

ACKNOWLEDGMENT

We are grateful to Dr. A K. Ghosh, Director, Cholera Research Centre, Calcutta, for the Phage typing and polymixin sensitivity of the isolated strains, and to Dr. S. C. Paul, Assistant Director, National Institute of Communicable Diseases, New Delhi for confirmation of some of our strains.

We thank the laboratory staff for their technical help.

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6

Ileosigmoid Knot

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Two long loops of intestine after crossing each other at their pedicles (Fig. 1) may produce two important pathological conditions. In one there may be only twisting together of the loops, and in the other one of the loops passes through the aperture produced by their crossing. The former is usually termed as 'intertwining' and the latter as 'knotting' (Fig. 2).

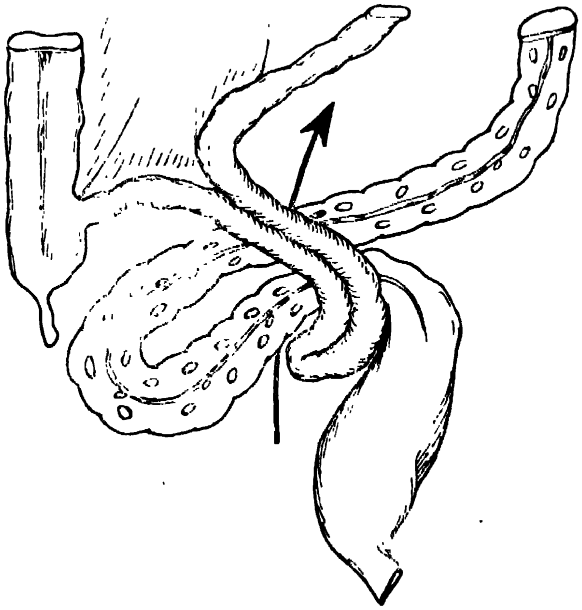

FIG. 1—SHOWING THE WAY OF FORMATION OF AN INTRA-PERITONEAL 'APERTURE' BY THE CROSSING OF THE INTESTINAL LOOPS

In most of the papers on this subject no differentiation was made between the two, though 'knotting' appears to be more deleterious in its effects and difficult in surgical management. While the unwinding of the 'intertwining' in any stage is comparatively easy, undoing of the knot in a delayed case is almost impossible. The articles on this subject were previously titled as 'double volvulus' (Burkitt, 1952; White, 1962), volvulus of the sigmoid with entrapment of the small bowel (Weinberg, 1958), intestinal knot syndrome, compound volvulus (Chandra *et al.*, 1970), etc.

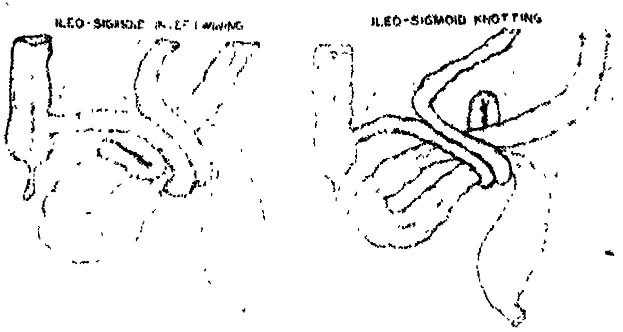

FIG. 2

This 'knotting' may occur between two loops of small intestine or between a loop of small gut and another of the large gut; the knot between ileal and sigmoid loops is the commonest and is termed as 'ileosigmoid knotting'.

Except in few countries of Africa (127 cases) and Europe (107 cases) these knotting or intertwining appear to be rare.

Only five cases of intestinal intertwining or knotting were reported from the Indian subcontinent. The case of Dunkerley (1953) was diagnosed as ileo-ileal knotting on postmortem examination. Sankaran (1962) observed in his case "The gangrenous loops of ileum and sigmoid intertwined and made into a knot; long loop of sigmoid had gone around the mesentery of ileum resulting in a twist of both the organs". No nomenclature was given to the case reported by Jain and Seth (1968). From the operation note it appeared to be ileosigmoid intertwining. Chandra *et al.* (*loc. cit.*) reported two cases of ileosigmoid knotting.

MATERIAL AND METHOD

The present paper deals with 9 cases of ileosigmoid knotting proved at operation in N.R.S. Medical College and Hospital, Calcutta, during the period from 1961 to 1969.

OBSERVATIONS

Age, sex and food habit—Age of the patients varied between 38 and 90 years, the average age being 55·4 years; the highest incidence (44·5 per cent) was in the 5th decade (Table 1).

Eight patients (88·9 per cent) were male and the remaining one (11·1 per cent) was female. Almost all the patients were of low economic status and mainly dependent on bulky carbohydrate diet. Patients were habituated with taking a large quantity of meal after a regular long interval.

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TABLE 1—SHOWING AGE AND SEX INCIDENCE

Age (decades)	Sex		Total	Percentage
	Male	Female		
4th	1	0	1	11·1
5th	4	0	4	44·5
6th	2	0	2	22·2
7th	1	0	1	11·1
8th	0	0	0	0·0
9th	0	1	1	11·1
Total	8	1	9	100

DIAGNOSIS :

Clinical features were almost similar to that of sigmoid volvulus but with comparatively less abdominal distension and features of more shock. Straight x-ray of the abdomen could be performed in 5 cases but barium enema x-ray in none. Though Friemann-Dahl (1942) tried to demonstrate the distended loops of both the intestines in a case as diagnostic radiological features of the ileo-sigmoid knot, in most of the cases of the present series these were found to be inconclusive. In fact, majority of the cases were diagnosed on laparotomy.

MANAGEMENT :

Depending on the clinical assessment sufficient fluid and electrolyte replacements along with blood transfusion in some cases were done. Operative intervention was not delayed more than 8 hours after the admission.

Laparotomy findings In most of the cases there was collection of fluid in the peritoneal cavity ; it was haemorrhagic in nature in those who had developed gangrene of the intestinal loops. The amount of haemorrhagic collection varied up to several pints.

At first sight it was, to some extent, difficult to understand the exact nature of the lesion. The authors' experience also supports the observation of Dunkerly (*loc. cit.*) that most of the cases apparently looked like an internal herniation of both the sigmoid and ileal loops through an opening in the mesentery.

It is evident that in 5 cases (55·6 per cent) both the loops of ileum as well as the sigmoid colon suffered from gangrenous change ; only the ileal loop became gangrenous in 2 cases (22·2 per cent) but only sigmoid loop in none. Out of the 7 cases who suffered from gangrenous change, the ileal loop became involved in all of them (100 per cent), whereas the sigmoid loop was affected only in 5 cases (71·4 per cent). Hence, it becomes clear that it is the small gut which suffers most in the formation of an ileosigmoid knot. A similar observation was also made by Shepherd (1967).

In making an ileosigmoid knot the ileal loop passes around the pedicle of a sigmoid loop in a clockwise or anti-clockwise direction ; the former was observed in 5 cases and the latter in one case only. In remaining 3 cases the records were incomplete as regards initial winding.

Table 2 shows the extent of gangrenous change in the individual gut.

TABLE 2 SHOWING EXTENT OF GANGRENE

Extent (in feet)	Number of cases	
	Small gut	Large gut
0 to 3	2	3
3 to 4	3	0
4 to 5	1	0
Not recorded	1	2

Extent of gangrenous involvement of the gut noted by Shepherd (*loc. cit.*) is considerably higher in comparison to that in the present series.

Operative procedures—The operative procedures undertaken are summarised in Table 3.

TABLE 3 -SHOWING OPERATIVE PROCEDURES UNDERTAKEN

Operative procedures	Nnmber of cases	Nnmber ot deaths
I. When no gangrene, only undoing of the knot after decompression	2	0
II. When only the small gut was gangrenous, resection-anastomosis of the small gut with		
(a) Shortening of the pelvic mesocolon by plication	1	0
(b) Paul-Mikulicz colostomy	1	1
III. When both the sigmoid and ileal loops were gangrenous, resection anastomosis of the small gut with		
(a) Paul-Mikulicz colostomy and closure afterwards	3	0
(b) Resection of the sigmoid colon, temporary closure of the distal stump and colostomy with the proximal one	2	1
Total	9	2

Cases where gangrene has already developed untying of the knots is dangerous, as it may give rise to rupture of the loops. In 2 cases where there was no gangrene, untying could be achieved satisfactorily after deflation of the loops with the aid of a widebore aspiration needle. This method was also suggested by Kallio (1932) a few decades ago.

In cases with a very tight knot and with gangrenous change, release of the knot was effected by applying clamps on the pedicle of the ileal loop followed by division of the gut in between (Fig. 3). The advantages of this method which was followed in most of the cases of the present series, were the complete exclusion of toxic contents of the gangrenous loops and the requirement of a very short time for the release of the knot.

In cases where only the sigmoid loop remained viable, after releasing the knot by division of the ileal element at its pedicle aspiration of the toxic contents of the sigmoid colon was done with the help of a flatus tube. This step was considered as an important precautionary measure to avoid toxaemia.

In 2 of the authors' personal cases, the terminal ileum was observed to be gangrenous up to 3 inches from the ileo-caecal valve; after the excision of the affected portion end-to-end ileo-ileostomy was performed accepting a slight risk in the immediate postoperative period. However, there were uneventful recoveries. In such cases Shepherd (*loc. cit.*) suggested closure of the distal segment of the ileum and end-to-side anastomosis between the proximal segment and the ascending colon through one of its taeniae.

Again in another two cases where only the ileal loops underwent gangrenous change, plication of the pelvic mesocolon or Paul-Mikulicz colostomy was performed with a view to prevent the recurrence of the sigmoid volvulus and thereby to nullify its role, if any, in the causation of an ileosigmoid knot. In this connection it must be mentioned that in 25 cases of ileosigmoid knotting reported by Shepherd (*loc. cit.*), sigmoid loop was neither plicated nor resected, but there was no recurrence either in the form of a sigmoid volvulus or as ileosigmoid knotting.

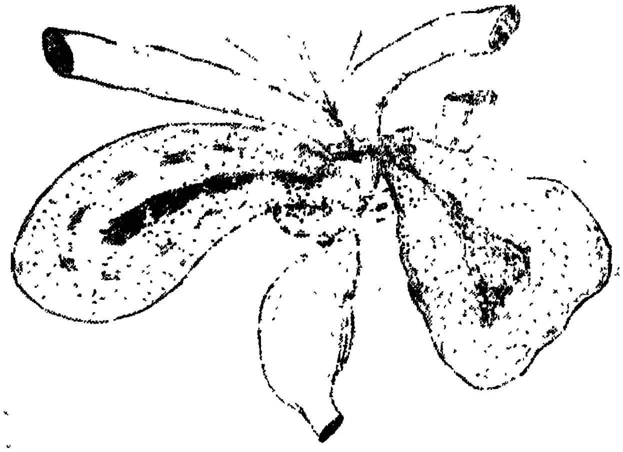

FIG. 3

In 5 cases of the present series (Table-2) both the ileal as well as the sigmoid elements of the knot were found to be gangrenous. In 2 of them the sigmoid colon became gangrenous distally up to the rectosigmoid junction. In those cases the dead sigmoid colon was resected, distal segment was closed at the rectosigmoid junction and a terminal colostomy was performed. In the other 3 cases Paul-Mikulicz colostomy could be performed without much difficulty. In 4 out of these 5 cases second stage reconstruction of the large gut could be achieved with a satisfactory result. The other case expired shortly after the primary operation.

MORTALITY :

There were 2 deaths (22·2 per cent) in the present series. Both occurred within a few hours of the operation. Shepherd (*loc. cit.*) noted 48 per cent mortality and majority of them died on the operation table. Many factors may be held responsible for this high mortality in the condition. Gastroduodenal suction, intravenous fluid replacement ond operative intervention in proper time should be considered as very important steps in the management. In the presence of strangulation of the gut, though the gastroduodenal suction and fluid replacement including blood transfusion are unable to improve the clinical condition to a greater extent, yet these can prevent surely the rapid deterioration, at least, for a few hours. If the operative intervention is not undertaken within this period, the condition of the patient may start going downhill further and ultimately multiple irreversible phenomena supervene.

FOLLOW-UP :

No recurrence of the condition or malabsorption syndrome were observed in the follow-up of the present cases. Shepherd (*loc. cit.*), in a follow-up of a large number of cases, observed malabsorption syndrome only in one case and recurrence in none.

CONCLUSIONS

Very few cases of ileosigmoid knotting or intertwining have so far been reported from India.

Authors are hesitant to think that the condition is rare because during a period of 9 years, 9 cases of ileosigmoid knotting could be reviewed from a single hospital.

Pre-operative diagnosis of the condition is very difficult, and even at laparotomy it may be confused with an internal herniation of the gut through a gap in the mesentery.

As the recurrence rate is almost nil in different series, excision of a part of the small gut having a wide mesentery is not recommended as a preventive measure.

ACKNOWLEDGMENT

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PRACTITIONERS' SERIES

Observations on Total Dose Intravenous Infusion of Iron Dextran in Treatment of Iron Deficiency Anaemia

S. K. GOUTAM*, G. S. MEHTA**

M. P. MISRA***

Anaemia is one of the commonest conditions that is encountered in general practice or in outpatient department of general hospitals. Iron deficiency is the commonest cause of anaemia all over the world. It is one of the most important factors incapacitating millions of people who either stop working or can work with only subnormal capacity. It is, therefore, highly desirable that the method of iron administration in these patients should be rapidly effective, safe and economical. Although oral iron therapy is economical, it is slow in action and its failure rate may be as high as 10-20 per cent (Holly and Grund, 1959; Scott, 1959). Further, treatment has to be continued for months even after haemoglobin percentage has been restored to normal for building and maintaining the reserves. It requires constant supervision to ensure regular and continued therapy.

Intramuscular iron therapy necessitates frequent visits to the doctors for injections. If one could somehow manage to get into the patient's system enough iron not only to make up the deficit of haemoglobin but also to replenish the depleted iron stores within a short period in the hospital patients would be benefited most. Total dose infusion (TDI) technique using iron dextran achieves this objective. Basu (1963) first introduced it to achieve the above objective. A number of reports have appeared the successful use of this technique without serious side effects (Chatterji *et al.*, 1964; Lane, 1964; Basu, 1965; Bonnar, 1965; Dawson *et al.*, 1965; Bhatt *et al.*, 1966; Elhence *et al.*, 1966; Pathak, 1966; Patel and Tulloch, 1967; Mahajan and Gupta, 1970). Here, we present our experience with this technique in 100 cases.

CLINICAL CONSIDERATIONS

Hundred cases of iron deficiency anaemia, hospitalised in Medical College Hospital, Jabalpur, with haemoglobin less than 10·0 g. per cent were studied. The diagnosis of iron deficiency anaemia was established by haemograms. All patients were weighed and the amount of iron required by each patient was calculated according to formula: $0{\cdot}3 \times W\,(100 - \text{Hb. per cent})$ where W is the weight of the patient in pounds. In cases associated with pregnancy, 10 ml. additional iron dextran (500 mg. iron) was added to the calculated dose to meet the demands of the foetus and also to compensate for the blood loss during delivery. Total calculated volume of iron dextran was added in one pint of normal saline or 5 per cent glucose or glucose saline solution taking care that the final concentration of iron dextran did not exceed 5 per cent V/V in any case. Cases with very severe anaemia and needing more than 25 ml. of iron dextran, the iron dextran solution was added in equally divided amounts in two bottles of the diluent. The infusion was started slowly at the rate of 8-10 drops per minute and was continued for 15 minutes. The patient was closely observed during this period for any immediate reaction. If no reaction occurred, the infusion was allowed to run at different rates in order to note any difference in toxic reaction met

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*** M.D., F.R.C.P., D.T.M. & H., Professor and Head with. Pheniramine maleate was given intramuscularly in 49 cases half an hour before starting the drip and 2 mg. of dexamethasone was added in the infusion in 16 cases while in thirty-five cases no medication was used. The difference in toxic reactions was noted. The amount of iron dextran complex administered varied from 16 ml. to 60 ml. with the mean being 31·02 (1530 mg.). 5 per cent dextrose solution, 5 per cent dextrose in saline and normal saline were used as diluents respectively in fifty-five, eighteen and twenty-seven cases.

SELECTION OF CASES

Age—The cases ranged in age from 16 to 70 years. 60 patients were between 21 and 40 years of age. There were 81 females and 19 males.

Cause of anaemia—Eighty-eight patients in the present study had history of blood loss by some route or other. In eight patients, the cause of anaemia was thought to be nutritional deficiency while in four patients no cause could be detected. Of eighty-eight patients, twenty-three had gynaecological causes (menorrhagia, fibroid uterus and cervical or uterine cancer), twenty-two had obstetric causes (pregnancy, puerperium), bleeding piles, hookworm infestation in 13 cases, portal hypertension in 9 cases and three patients had malignancy of the gastro-intestinal tract.

A large number of cases had other diseases besides iron deficiency anaemia, e.g., nineteen patients were suffering from amoebiasis, enterobiasis was present in 9 cases, ascariasis in 8 cases and giardiasis in 2 cases. Six patients were pregnant at the time of treatment. Ringworm infestation was present in five patients. Four patients each were suffering from urinary tract infection and prolapse uterus. Benign prostatic hypertrophy, systemic hypertension, emphysema, chronic bronchitis, pulmonary tuberculosis, diabetes mellitus, lathyrism, puerperal psychosis, pellagrous dermatitis, leucoderma, filariasis, syphilis and carcinoma neck were the other associated illnesses at the time of treatment.

INVESTIGATIONS

Routine haemograms were done in all patients. The initial haemoglobin varied from 2·1 g. per cent to 10 g. per cent with the mean initial haemoglobin to be 6·06 g. per cent. All the patients were having haemoglobin less than 10·0 g. per cent. Fifty-four patients had initial haemoglobin below 6 g. per cent, forty patients between 6·1 and 9·0 g. per cent and seven patients between 9·0 and 10 g. per cent.

The red cell count varied from 1·5 to 4·7 million/c. mm., with the mean count to be 3·13 million/c.mm. Forty-four patients had total RBC count between 1·51 and 3 million/c.mm. and fifty-four between 3·5 and 4·5 million/c.mm. Only two cases had total RBC count below 1·5 million/c. mm. and three cases above 4·5 million per c.mm.

The colour index varied from 0·41 to 0·8 with the mean being 0·63. MCV varied from 52 $c\mu$ to 75 $c\mu$ with the mean being 68·9 $c\mu$ and MCHC from 20 to 30 per cent with the mean to be 25·9 per cent.

Peripheral blood film examination revealed microcytosis and hypochromia in all the cases.

Bone marrow studies were made in 72 cases and found to be normoblastic in all patients.

Serum proteins were estimated in fifty-two cases and were less than 5·0 g. per cent in 1 case. Serum albumin was less than 3·0 g. per 100 ml. in 10 cases. Serum globulin was more than 3·0 g. per 100 ml. in 15 cases.

REACTIONS

Many forms of reactions both immediate and delayed were observed in sixty-six patients (66 per cent) while thirty-four patients did not show any reaction.

(a) Anaphylactic reaction necessitating resuscitative measures was encountered in one case only who did not receive any pre-infusion medication.

(b) Delayed type of reactions noticed were as follows:

Forty-one patients in the present study developed fever during or after TDI. Twelve patients developed fever during the infusion and twenty-nine developed fever after a few hours of the infusion. The fever ranged from 99 to 103°F and subsided of its own within 2 to 7 days in twenty-nine cases.

Twenty-three patients had joint pains. In most of the cases it was in multiple joints. This complaint lasted for 2 to 6 days.

The drug appears to have a definite local irritant effect since thrombophlebitis of varying degree was observed in twenty-two patients. Two patients had only pain at the site of infusion while fourteen patients had mild thrombophlebitis and six had severe thrombophlebitis.

Seventeen cases developed generalised bodyaches and pains. These occurred within 1-2 days of infusion and persisted for 3 to 7 days. The pain was marked in calf muscles and controlled by analgesics.

Seven patients had restlessness and sensation of sinking. Five patients during infusion developed chills and rigors. Other manifestations were diarrhoea (4 patients), nausea and vomiting (3 patients), giddiness, palpitation, headache and pain in limbs (3 patients each), swelling of lips, restlessness and sensation of heat (1 patient each).

In long term follow-up of seven patients up to one year no late toxicity has been noticed in any form.

Incidence of toxic reactions in patients without premedication, patients who received pheniramine maleate and cases receiving dexamethasone had been 28/35 (80 per cent), 33/49 (67·3 per cent) and 5/16 (31·25 per cent) respectively. It was highest (41/55 or 74-54 per cent) when 5 per cent dextrose was used as a diluent, and lowest (13/27 or 48·14 per cent) when normal saline was used as a diluent.

No adverse reactions have been noted when drip was given fast except a little rise in the incidence of fever and joint pains and in such patients the incidence of thrombophlebitis was much less common if compared to the patients where drip was given slowly.

There was no difference in the severity or type of reaction when different amount of iron dextran was infused and hence no change with the varying severity of anaemia.

No difference has been noted in toxic reactions in different aetiological types of anaemia in the present series. They have been found with almost equal frequency in medical and obstetrical or gynaecological cases.

No difference could be detected in type and severity of reactions with different associated conditions. Associated ailments have not been found to be aggravated.

Out of 51 patients having total serum proteins more than 5 g. per cent, thirty patients noticed reactions while twenty-one patients did not notice them. One patient who had total serum proteins less than 5 g. per cent had reaction.

HAEMATOLOGICAL RESPONSE

Of hundred patients treated with TDI, 80 cases were followed for a period of 4 weeks or more. Eight cases were examined 3 weeks after the treatment and eleven patients were followed up for two weeks. One case had anaphylactic reaction.

The results of haematological response i.e., rise in haemoglobin in the first 4 weeks are shown in Table 1.

TABLE 1—SHOWING THE RESPONSE TO TOTAL DOSE INFUSION OF IRON DEXTRAN

Weeks after the iron dextran TDI	No. of cases examined	Average Hb. rise in g./100 ml./ week
1st	99	1·56
2nd	99	1·32
3rd	88	1·14
4th	80	1·02

The maximum rise in haemoglobin was observed during the 1st week after infusion than during the subsequent weeks as observed in Table 1. There had not been any difference in haematological response with the dose, diluent or speed of I.V. medication. No difference in Hb. response has been noted in patients with or without toxic reactions.

Reticulocyte counts were done in 99 cases at various intervals after the total dose infusion. Reticulocyte response is shown in Table 2.

TABLE 2—SHOWING RETICULOCYTE RESPONSE AFTER TOTAL DOSE INFUSION

Maximum reticulocyte count (per cent)	No. of cases
2 to 5	27
5·1 to 10	42
10·1 to 15	21
15·1 to 20	7
More than 20	2

CLINICAL IMPROVEMENT:

Most of the patients started feeling better by the end of 1st week after TDI. The change in pallor was noticed definitely within a fortnight. It took a longer time for glossitis and haemic murmur to disappear and still longer time for koilonychia to disappear and for the nails to regain normal shape.

DISCUSSION

It is now a known fact that iron deficiency anaemia is one of the commonest illnesses encountered in economically backward countries. In search of better methods for its treatment, introduction of total dose iron dextran infusion by Basu (1963) is an important landmark. Since then, the technique has been extensively tried and various reports from all over the world have been published.

High incidence of side reactions in the present study (66 per cent) may be attributed to the more liberal use of 5 per cent dextrose as a diluent and it was also found to be highest in the 5 per cent dextrose group. The incidence of anaphylactic reaction was 1 per cent and the patient was resuscitated in a few minutes without any difficulty. Varde (1964) used the procedure in 300 obstetrical cases, found it to be safe and observed only one anaphylactic reaction. Scott (1965, while reviewing 1807 fully documented cases reported from various parts of England, found anaphylactic reaction in 0·28 per cent of cases (excluding series of Clay *et al.*, 1965). In their personal series of 200 cases of anaemia treated with this method, they too encountered very few side reactions and only one patient had anaphylactic reaction. On the other hand, Clay *et al.* (*loc. cit.*) observed severe anaphylactic reactions in 7 of their 150 cases (4·5 per cent). A comparatively higher incidence (1·2 per cent) of serious reaction was also reported by Bonnar (1965) in his series of 200 obstetrical cases. It was interesting to note that both Clay *et al.* (*loc. cit.*) and Bonnar (*loc. cit.*) observed the side reactions only in antenatal cases and not in postnatal cases. In India Prakash *et al.* (1966) used this procedure in 40 non-obstetrical cases and encountered serious reactions in 2 cases (5·0 per cent). In 2 more cases drip had to be discontinued soon after starting the infusion. Pathak (1966) and Elhence *et al.* (*loc. cit.*) have also reported toxic effects in 4·5 per cent and 7 per cent cases respectively. Nath and Omar (1967) have encountered toxic reactions in 12 per cent cases with one fatal case. Mehta and Patel (1968) observed the incidence of anaphylactic reaction and systemic reactions to be 0·8 per cent and 30·9 per cent respectively. None of the cases had anaphylactic reaction in the series by Mahajan and Gupta (*loc. cit.*).

No correlation between the toxic reactions and other factors like the rate of infusion, severity of anaemia, aetiology of anaemia, associated conditions, etc., has been found in the present study.

Cases who had local or systemic reactions in the present series were in no way different from cases who did not develop reaction and it seems that reactions are due to individual sensitivity (Humpharies, 1966 ; Mehta and Patel, *loc. cit.*). However, the incidence of such reactions reported from other Indian workers (Bhatt *et al.*, 1966 ; Thaman and Dogra, 1966) is also high if compared to the incidence of such reactions reported from western countries which is much lower (Varde, 1964 ; Basu, 1965 ; Bonnar, 1965). Further investigations are necessary to find out other causes of the higher incidence of reactions in Indian patients.

Haematological response—The mean total haemoglobin rise after TDI during 4 weeks was 5·17 g. per cent which compared favourably with that of Nath and Omar (*loc. cit.*). The mean Hb. rise in the initial two weeks (2·88 g. per cent) was higher if compared with that in the subsequent two weeks (2·16 g. per cent). This has also been observed by Nath and Omar (*loc. cit.*) and Upadhyaya and Mishra (1967). The haemoglobin rise per week varied from 0·5 to 3·0 g. per cent in the present study with the average weekly Hb. rise to be 1·23 g. per cent which also closely resembles those of other studies, as observed in Table 3.

TABLE 3—SHOWING HAEMOGLOBIN RISE PER WEEK IN VARIOUS SERIES

Author	No. of cases	Year	Hb. rise in g.% per week
Basu (1965)	30	1965	1·2
Lane (1963, 1964)	55	1964	1·03
Varde (1964, 1966)	307	1964	1·43
Bonnar (1965)	250	1965	1·0
Pathak (1966)	70	1966	1·5
Elhence *et al.* (1966)	30	1966	1·6
Nath and Omar (1967)	34	1967	1·2
Mahajan and Gupta (1970)	25	1970	1·25
Present series	100	1970	1·23

Less time was taken by haemoglobin to rise from 3·0 to 7·0 g. per cent than from 7·0 to 13·0 g. per cent in the present study. Similar finding has been observed by Bhatt *et al.* (1968) and Mahajan and Gupta (*loc. cit.*) It was further observed that the ultimate rise in haemoglobin achieved at the end of 4 weeks was highest in cases having the lowest initial haemoglobin.

Seventeen cases in the present study had haemoglobin rise less than 4·0 g. per cent in 4 weeks and can be explained by the view of Humpharies (*loc. cit.*) that in all patients one cannot expect to obtain 1·0 g. Hb. rise per week as it is usually not possible at once to eradicate the cause of anaemia. Hb. rise more than 3·0 g. per cent in 1st week was obtained only in 4 cases (4·04 per cent) but Hb. rise of 4·0 g. or more per week had been achieved in none of the cases as has been reported to be achieved after total dose iron dextran complex infusion by Chatterji *et al.* (*loc. cit.*).

Poor haemoglobin response has been observed in cases associated with malignancy which may be due to continuous blood loss even after total dose iron dextran infusion or poor haemopoiesis. Comparatively slow haematological response in cases associated with pregnancy is attributed to latent folic acid deficiency as put forward by Bonnar (*loc. cit.*) and Bhatt *et al.* (1968).

As a whole, average haemoglobin rise after total dose iron dextran infusion, as achieved in the present study, was not very impressive. It was only marginally greater than those achieved by other methods. Dawson *et al.* (*loc. cit.*) and Nath and Omar (*loc. cit.*) have also expressed similar views.

SUMMARY

Total dose iron dextran complex infusion has been tried in hundred cases of iron deficiency anaemia having haemoglobin less than 10·0 g. per cent. Blood loss was the common cause of anaemia found in eighty-eight per cent cases. The bone marrow examination in 72 cases showed normo-

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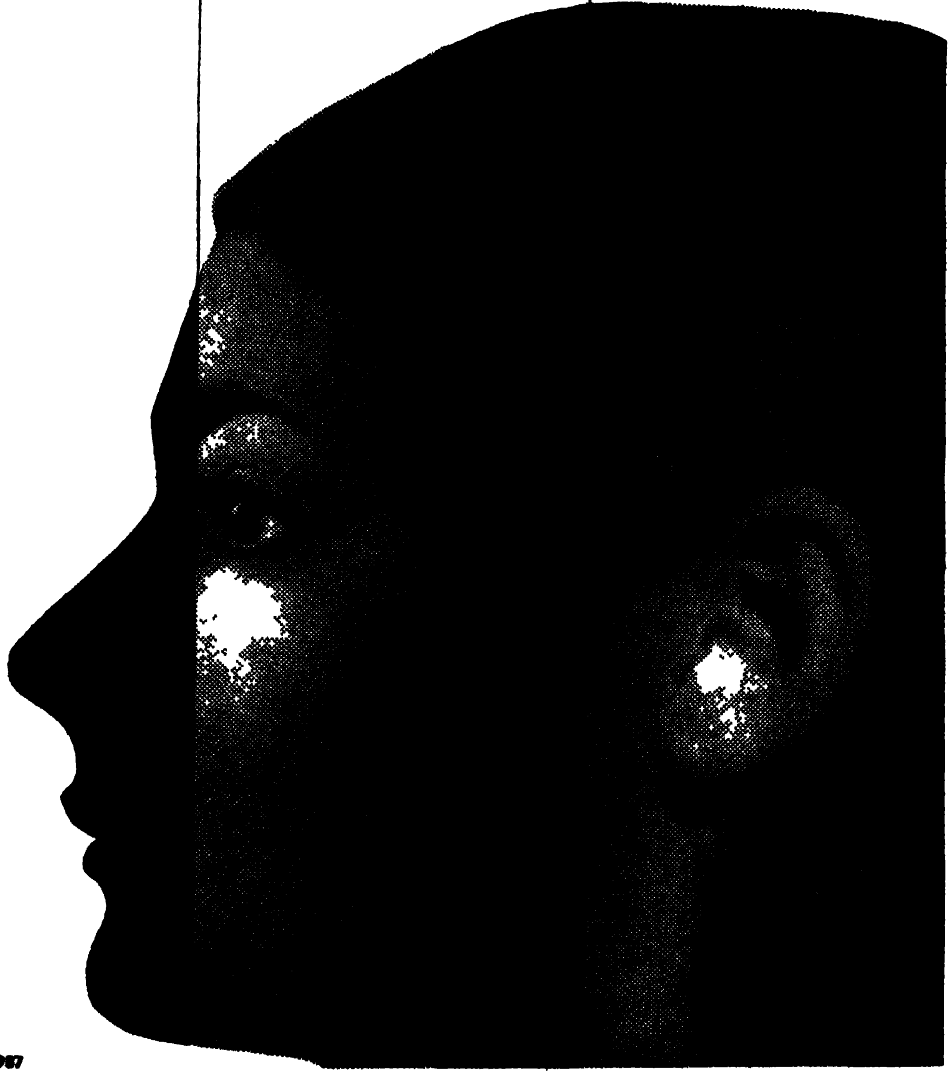

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blastic reaction. Large number of cases had other associated ailments, e.g., hepatosplenomegaly, dysentery, etc.

The amount of iron administered varied from 800 to 3000 mg. The haematological response, as judged by haemoglobin rise, was satisfactory. Average haemoglobin rise per week in the present study was 1·23 g. per cent. The average rise in haemoglobin during the first two weeks (2·88 g. per cent) had been higher than in subsequent two weeks (2·16 g. per cent). The average increase in haemoglobin in 4 weeks after infusion was 5·17 g. per cent.

Toxic reactions have been observed in 66 per cent cases of the present study. Commonest side effects were fever (41 per cent), joint pains (23 per cent), thrombophlebitis (22 per cent) and bodyache (17 per cent). Anaphylactic reaction was observed in one case only. Associated illness like urinary infection, diabetes mellitus, etc., were not aggravated.

No correlation was observed between the incidence, severity and type of reaction on one side and other factors, e.g., premedication, diluents, rate of infusion, severity of anaemia, aetiological factors of anaemia, associated ailments and serum proteins on the other side.

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Imferon (Fisson Pharmaceutical) brand of iron dextran and Avil (Hoechst) brand of pheniramine maleate were used.

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CASE NOTE

Stevens-Johnson Syndrome Due to Thiacetazone

S. A. HUSSAIN*, H. C. SAKSENA**

R. P. KOTHARI***

It was Alibert (quoted by Sainani and Balsara, 1970) who first of all described this clinical entity in 1828. Subsequently this syndrome was described independently by Stevens and Johnson (quoted by Sainani and Balsara, *loc. cit.*) in 1922 and it now bears their names.

There are two varieties of this syndrome:

(1) Idiopathic and

(2) Secondary, where the factors implicated in its aetiology are (a) infections, e.g., pneumonia, meningitis, measles; (b) sera, (c) alimentary toxins and (d) drugs (Short, 1957; Cohlan, 1960; Dubb, 1961).

The common drugs which rave been described by various workers (Straus, 1948; Scott, 1956; Salvaggio and Gonzale, 1959; Cohlan, *loc. cit.*; Strom, 1962; Watts, 1962; Beveridge *et al.*, 1964; Ingle and Banoo, 1965; Ban and Bose, 1965) to cause this syndrome are iodides, salicylates, barbiturates, codein, antiepileptics, mercury, quinine, sulphonamides, penicillin, meprobamate and phenylbutazone.

This disease is characterised by an acute febrile onset followed by mucocutaneous eruption which may take a vesiculo-bullous form with exfoliation. Ulcers may develop in all the mucous membranes, so that the patients present themselves with conjunctivitis, stomatitis, urethritis and balanitis. Ocular manifestations are commonly associated in 50-80 per cent cases and have a sinister import, even blindness has not infrequently resulted.

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In spite of worldwide reports of these cases, there are few reports in Indian literature of this syndrome and hence we thought it worthwhile to publish the three cases, we came across, which resulted due to thiacetazone toxicity.

CASE REPORTS

CASE 1:

B. L., a 37-year-old man was admitted to the Associated Group of Hospitals attached to S. P. Medical College, Bikaner on 4-5-1971 with the diagnosis of thyrotoxicosis with pulmonary tuberculosis. He was put on tablets of carbimazole, injection of streptomycin and a combination of isoniazid and thiacetazone.

After 17 days of this treatment, patient suddenly developed high fever, malaise and a skin eruption. On examination, patient was very ill indeed (temperature 103°F, pulse rate 120/minute and respiratory rate 24/minute). He showed severe and extensive ulcerative stomatitis with involvement of gums, tongue and lips. He also had a purulent conjunctivitis, severe blepharitis accompanied by photophobia, a purulent urethral discharge, and ulcerative lesions around the anus and anterior nares. He had a generalised but sparse haemorrhagic eruption with numerous lesions on the hands (Fig. 1) and feet, some of which were apparently showing secondary infection.

This picture conformed to that of Stevens-Johnson syndrome. All the drugs were then stopped and patient was put on 1 mg. of dexamethasone six hourly, by oral route. His temperature fell slowly and became normal on the 7th day of the onset of this reaction. Lesions continued to appear for until the 5th day of the reaction. After this the recovery was quite steady and satisfactory. Within a period of 15 days all the mucocutaneous lesions healed completely. The dose of dexamethasone was gradualy tapered off.

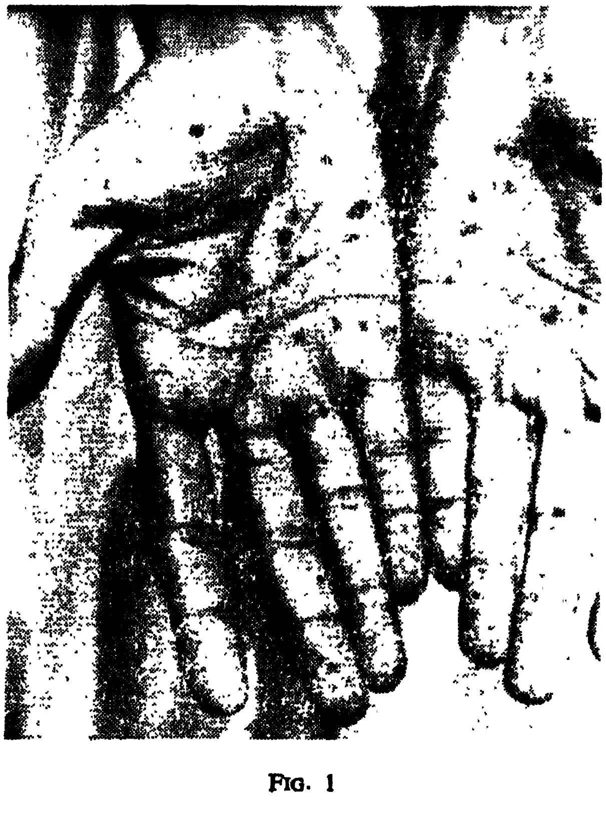

FIG. 1

After the subsidence of these lesions the patient was given streptomycin, isoniazid and carbimazole in succession, but no recurrence of reaction took place. This led us to conclude that the syndrome of Stevens-Johnson was precipitated by the drug thiacetazone. The patient was discharged from hospital on 19-7-1971 in good condition.

CASE 2:

S. L., a 35-year-old Hindu male was admitted in the Tuberculosis Hospital of S. P. Medical College, Bikaner with the diagnosis of pulmonary tuberculosis. A drug regime of streptomycin, isoniazid and thiacetazone was started.

25 days after starting this regime the patient suddenly became extremely ill. Both eyelids got swollen and there was a profuse purulent discharge from his eyes. His lips were cracked and bleeding and there was a general oozing of serosanguinous fluid from the gums. He could hardly talk, and complained of a sore throat and dysphagia. The nares were blocked with dried blood. The body was covered with a generalised haemorrhagic rash, mainly on the chest, back and upper extremities. The rash varied from small papules to bullae of 1 cm. in diameter. The meatus of the urethra was also pouting and inflamed.

All antituberculosis drugs were stopped and the patient was given broad spectrum eye drops for local use. Prednisolone in doses of 10 mg. four times a day was started. His general condition rapidly improved and the discharge from eyes ceased. The oral lesions dried up and the mucous membranes returned to normal. The rash also resolved. The dose of prednisolone was tailed off as the condition improved.

After the end of 2 weeks streptomycin and isoniazid were started one by one but there was no reaction. Hence the conclusion was that the picture of Stevens-Johnson syndrome in this case was caused due to thiacetazone.

CASE 3:

N. R., a youth of 25 years, was admitted in the Tuberculosis Hospital of S. P. Medical College, Bikaner as a case of pulmonary tuberculosis. He was put on streptomycin, isoniazid and thiacetazone regime.

On 22nd day of this therapy he became quite ill and developed red spots on various parts of his body. Next morning there developed swelling of the eyelids, ulcerations in the mouth and there was burning sensation during micturition.

On examination the patient was found to be in a state of severe agony. His face looked puffy and the eyelids were swollen and oedematous, closing the eyes completely. The skin over the eyelids had become denuded leaving red, raw and ulcerated areas covered by reddish crust. On retracting the lids, pseudomembranous conjunctivitis was found and the cornea was hazy in both the eyes. Numerous ulcers covered with reddish brown discharge were present on the lips and in oral cavity. Many of these lesions showed crusts and fissures. The skin rash was polymorphic and was present all over the body, except soles of feet. The rash was specially marked on the face and trunk.

In addition to supportive therapy, prednisolone was started in dosage of 40 mg. in 4 divided doses. The steroid treatment was gradually tailed off and eventually stopped as the condition of patient improved. The response to treatment was good. But in spite of intensive treatment of his ocular complications, he lost complete vision in right eye and partial in left.

DISCUSSION

Stevens-Johnson syndrome is considered to be a severe form of erythema multiforme, a toxic or allergic reaction to drugs or a foreign protein. Virus aetiology has also been postulated from time to time (Womack and Randall, 1953; Forester and Scott, 1958; Wasserman and Glars, 1959). In the past few years case reports of Stevens-Johnson syndrome developing after thiacetazone therapy have been published from various places (Moore, 1960; Harland, 1962; Ingle and Banoo, *loc. cit.*; Seth and Mukherjee, 1966; Doyle, 1968). But reports from our country are not many. The fact observed in these reports is that the incidence and severity of cutaneous manifestations varies from country to country. In Madras (Tuberculosis Chemotherapy Centre) Stevens-Johnson syndrome occurred in 4 cases (6 per cent) out of all those who developed skin toxicity of various types. In contrast among the 50 patients with skin rashes in Hong Kong there was not a single case of Stevens-Johnson syndrome (Hong Kong Antituberculosis Ass. Report, 1958). In Rabat (Rubence, 1968) curiously, Stevens-Johnson syndrome was found predominantly in the female sex, whereas our all the three cases were of male sex. In Tanzania (Doyle, *loc. cit.*) nearly half of the cases of Stevens-Johnson syndrome due to thiacetazone were from one tribe only. No explanation is available at present for these disparities.

In all the 3 cases reported above, the patients developed the disorder while they were receiving three drugs, viz., streptomycin, isoniazid and thiacetazone. Streptomycin and isoniazid are being used for many years, but so far they have not been mentioned in the causation of this syndrome. Therefore in our cases, it is most likely that the reaction was due to thiacetazone. No doubt, there are pitfalls in attributing a causal relationship to a drug in a syndrome of unknown aetiology like Stevens-Johnson syndrome; but the occurrence of the disorder about three weeks after the commencement of the drug, recovery after its withdrawal, reinstitution of rest of the two drugs namely streptomycin and isoniazid without any reaction and similar other reports (Moore, *loc. cit.*; Harland, *loc. cit*; Ingle and Banoo, *loc. cit.*; Singh and Shah, 1970), suggest that although this may not be the actual cause, it may be the crucial precipitating allergic factor in the production of this syndrome. Hence, one should keep in mind the possibility of this complication besides the other known toxic reactions which are associated with thiacetazone administration.

With the increasing use of thiacetazone as a replacement of PAS in the treatment of tuberculosis in a country like India, where tuberculosis is still a very common disease, it may well be that more cases of thiacetazone induced Stevens-Johnson syndrome will be seen in the future.

SUMMARY

Three cases of Stevens-Johnson syndrome due to thiacetazone toxicity are reported here. All the three cases recovered from this toxic reaction on withdrawal of the drug and administration of steroids, but one of them was left with loss of vision, complete in right eye and partial in left eye.

ACKNOWLEDGMENT

We are thankful to Prof. K. D. Gupta, Principal and Controller, S. P. Medical College and Associated Group of Hospitals, Bikaner for permitting us to publish these cases.

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Rural Health

Years of gigantic national struggle brought freedom to our country in 1947 and along with it even greater challenge to our devotion, ingenuity and resourcefulness to remove the existing hindrances to fuller enjoyment and expression of life. The most formidable challenge was in the field of health in general and rural health in particular.

Happily, two potential weapons were also ready at hand to meet this exigency. One was the report of the Health Survey and Development Committee under Sir William Joseph Bhore, which was published in 1946 and was a classic among such publications, and the other was the national organisation of the medical profession in India—the Indian Medical Association—which was avowedly committed to fullest co-operation in this venture with all resources at its command. The task that remained then was a matter of forging, developing and wielding of these weapons for implementing the most effective health strategy and tactics.

The Bhore Committee report, as it became popularly known in its successive chapters, elaborately depicted the sombre realities in every aspect of health, its low levels and the causes thereof, the inadequacies of health personnel, the deficiencies in organisations, the unfavourable geo-topographical conditions, the vastness of the population and their ethnic peculiarities, etc. The report also enunciated the objectives to be attained and elaborated on the phased and time-bound strategy and tactics for the development of the Nation's health keeping the immediate as well as the future need in view. The acceptance of this report by the National Government underlined the need for and strengthened our faith in developing the health of the Nation in accordance with the tenets of modern medical science.

The Indian Medical Association in token of its full co-operation participated in the E.S.I. Scheme (published in 1948 and enacted in 1950) then being implemented as a Social Health Insurance Scheme for the working population in the industries. It also participated in different national programmes for eradication of diseases. It advanced its views and thoughts in all other fields of health development and displayed its readiness to take part in the mobilisation and effective deployment of all available resources and manpower.

The Five-Year Plans, in which the recommendations of the Bhore Committee were incorporated, were launched and these brought into existence new health centres at union levels, new district and sub-divisional hospitals, new medical colleges, new training centres for paramedical personnel, and new pharmaceutical industries, etc. Expectations hitherto undreamt of pervaded the minds of the rural people. Their inertia and fatalism gave place to vital and reverbrating assertions of their right to enjoy the benefits of scientific medicine.

It soon became evident, however, that serious shortcomings were developing in the targets as well as in the qualities of medical care catered. No doubt, some edifices had been erected, some perquisites and some personnel had also been mobilised, but the spark of life and the inspiration to coordinate and correlate these into some worthwhile activities were missing.

A re-appraisal was made by the Mudaliar Committee in 1961. Re-affirming the development of health according to tenets of scientific medicine it outlined some practicable modifications of the standards advocated by the Bhore Committee. This report was also accepted by the Government. Even this did not appreciably influence the existing state of things. Vast tracts of land and population continued to remain without the benefits of medical aid and healthful living and those that had were dissatisfied with the inadequacy of the measures. The uplifted mood of the rural population began to turn surly when delay occurred in the fulfilment of their expectations about health care. Political leaders, on the other hand, added a sense of urgency to these expectations.

Health Centres, which form the sheet anchor of health activities, did not receive the attention they deserved. Incompletely equipped, inadequately supplied and under-staffed, they gradually became veritable nightmares for the medical staff who were to function in them. Instead of realising this, the powers that be made the doctors the most convenient scapegoats for their own failures by resorting to a sustained propaganda on the doctors' reluctance to go to the rural Health Centres.

The cry was taken up in interested quarters and soon it was found that the Health Centres, their locations, personnel, equipment, etc., provided the most handy weapon in the armoury of the political propagandists who aspired for power. The inevitable consequences of such a state of affairs were manifest before long, when the country saw that doctors in their counters were being intimidated, assaulted, and even murdered and their properties were being ransacked or destroyed by miscreants.

The Indian Medical Association drew pointed attention of the Government and the public to this fast deteriorating state of affairs. It recommended practical measures to deal with the shortcomings in the Health Centres and suggested methods to meet the shortage of doctors in rural areas. It offered the services of its volunteers to tide over the difficult situations, wherever encountered, until properly planned and stable measures could be introduced. The Association invited the Government to utilise its resources and discuss the problems and measures across the table in planning and implementing the health plans and activities. Its recommendations on medical education and on planning and training of medical and paramedical manpower went unheeded.

Even when the Government condescended to discussions, the final decisions jointly arrived at were never worked out. For instance, confronted with the vast problem of population explosion after the first spell of infructuous spending of public money on Family Planning, the Government eventually agreed to sit with the I.M.A. for the purpose of finding out meaningful methods to deal with the problem. Even prior to this the I.M.A's plan to deal with this vital problem was already there in the possession of the Government. Government's acceptance of the plan was also communicated to I.M.A. It served only to highlight the lack of seriousness of purpose, because the ubiquitous bureaucracy was successful in preventing implementation of any part of the plan. Then the aforementioned joint session of the Government and the I.M.A. took place. A five-point joint decision was taken in all solemnity, but only to cause another major disappointment to I.M.A. through non-implementation of the same. There is little wonder after all this as to why the problem of tackling population explosion is in the most unsatisfactory state in spite of continuous and ever-increasing spending of public money on this endeavour.

The rural health care provides another outstanding example. The Indian Medical Association being alarmed at the unsynchronised planning of rural development and inadequacy of mobilisation of resources, particularly, in respect of rural health measures made recommendations to the Government from year to year touching on each and every important aspect of the same. Needless to say, the Government preferred to work in isolation and therefore, these recommendations were treated with utter disregard. Undeterred by this, the I.M.A. succeeded in holding a session with the Government in which the then Hon'ble Minister in-charge of Health and the Secretary to the Government of India's Department of Health, took part. From the deliberations evolved some principles and working details of the future pattern of rural health planning and possibly as a follow-up of these deliberations, a "Master plan" was drawn up and circulated. Going by past records, the chances for implementation of this latest plan can be anybody's guess.

The decade of the sixties witnessed a high tempo of activities in the political arena. There was considerable impact of the same on health planning and health activities. It was dismaying to find a plethora of plans on health emerging from one source or another. The latest and the most formidable one bearing the blessing of the Union Ministry of Health, is the Rs. 180-crore Plan.

One can reasonably ask what has happened to the Bhore Committee's recommendations or Mudaliar Committee's recommendations or the Master Plan for Rural Health? Does the Rs. 180-crore Plan in any way conform to the objective principles set out in the Fifth Plan approach papers? Is the Plan based on a scientific assessment of the country's needs and has the Government the requisite enforcing machinery for its implementation? Has the Government given up its path of pursuing science in its various development plans or has it preferred to adopt a pseudo-scientific approach with the avowed purpose of offering quick solutions where science is supposed to have failed?

It is quite clear that all such schemes germinate because the Government has no declared "health policy" in spite of I.M.A.'s repeated demand for the same. When the Government introduced the E.S.I. Scheme, the I.M.A. hailed it believing it to be the precursor of eventual nationalisation of health services. In fact the approach papers of this scheme also indicated as much. The clean thinking of those days has yielded place to an utterly confused outlook which marks the health policies of recent times. Declaration of a "health policy" has now become incumbent upon the Government and the sooner it is done the better for all concerned.

The Rs. 180-crore Plan, as it is set out in the text, seeks justification from the fact that rural people will start receiving immediate service through the agency of quickly-trained personnel to offer them the products of various disciplines of medicine for relief of their ailments. The concept defeats itself at once by the problems it gives to namely, (i) how are this practically untrained horde of people going to put into proper use the products of modern science, when even the person most educated in the science occasionally fail?; (ii) why this double standard of medicine—one for the rural people and one for the urban, and (iii) if dearth of the medical personnel was the compelling factor, it cannot be denied as well that the number as per recorded figures, of *qualified doctors* in various recognised disciplines taken together already provides a doctor-population ratio of 1:750.

On the face of it, therefore, the proposed Rs. 180-crore Plan or any modification of it, seems to harbour a deeper motive than what is given out.

What now stands out before the country is that all responsible sections of the people must say an unequivocal 'no' to these mushroom plans, reiterate their unshakable faith in the development of health and medical aid along scientific lines and abhor even any diluted version of the same.

About the non-availability of doctors for rural areas, the cause for which has been repeatedly given out as their profit motive and disinclination to serve, it has been unequivocally stated by the I.M.A. on many occasions that the doctors of this country are no less patriots than the other sections of the people and whatever may be their privations they will not be lagging behind if they are called upon to shoulder any responsibility bestowed on them by the Nation. The records of the freedom movement in the past as well as the reports of the performances of the doctors during various relief operations and during National Emergency provide enough evidence in support of this claim. What they are not prepared to do is to become victims of administrative inefficiency, ineffectual planning and a muddle of conflicting philosophies. They require above everything proper environment, adequate equipment, and justified assistance so that they can have the satisfaction from their jobs—the satisfaction that comes from the feeling that their hard-earned education will be useful to the people they are expected to serve.

The I.M.A. has repeatedly alerted the members of the medical profession to be vigilant about their own performance in accordance with the highest tenets of medicine.

It is therefore, high time for the people in authorities to give up ideas which cannot but be looked upon as unprofitable platitudes in view of the realities of the situation, sit with the I.M.A. with an open mind and find solutions to the ever-increasing problems of health in our country.

K. K. Das

CURRENT MEDICAL LITERATURE

Birthweights in Children with Phenylketonuria and in Their Siblings

SAUGSTAD, L. F. (*Lancet*, **1**: 809, 1972) from E.E.G. Laboratory, Oslo 4, Norway, writes:

The birthweights of 86 sibs of 53 Norwegian children with phenylketonuria (P.K.U.) were compared with birthweights of controls from Sweden and found to be 300 g. higher on the average, despite an increased frequency of pre-term births and an abnormally high frequency of pregnancy abnormalities. Birthweights of P.K.U. children averaged more than 500 g. lower than those of their sibs. This reduced rate of foetal growth in P.K.U. is associated with increased perinatal morbidity and with limited intellectual achievement. These results suggest that P.K.U. infants may already be abnormal at birth. Prevention of further brain damage demands immediate dietary treatment, but this is likely to be difficult because P.K.U. children probably have an increased susceptibility to malnutrition.

The Use of Cephalexin in the Treatment of Gonorrhoea

ACKMAN, C. F. D., REID, E. C. AND HOMSY, Y. (*Canad. Med. Ass. J.*, **106**: 350, 1972) from the Department of Urology, The Montreal General Hospital, 1650 Cedar Avenue, Montreal 109, Quebec, write:

A clinical trial of cephalexin in the treatment of gonorrhoea was carried out in 26 adult patients. The cure rate was 73 per cent. There was a relapse rate of 11·3 per cent and persistence of the pathogen in 15·4 per cent. A linear relationship between dosage and cure rate could not be demonstrated. Disc sensitivity testing did not correlate well with clinical results. It is concluded that cephalexin is useful as a second line drug in gonorrhoea after sensitivity of the organism has been demonstrated.

Primary Hyperparathyroidism

POWELL, D., SHIMKIN, P. M., DOPPMAN, J. L., WELLS, S., AURBACH, G. D., MARX, S. J., KETCHAM, A. S. AND POTTS (JR.), J. T. (*New Eng. J. Med.*, **286**: 1169, 1972) from the Endocrine Unit, Massachusetts General Hospital and the Department of Medicine, Harvard Medical School, the Department of Diagnostic Radiology, Clinical Centre, and the Surgery Branch, National Cancer Institute, and the Section on Mineral Metabolism, Metabolic Diseses Branch, National Institute of Arthritis and Metabolic Disease, National Institutes of Health, Bethesda, Md., and the Department of Radiology, University Hospital, University of California, San Diego, comment:

To achieve pre-operative localisation of abnormal parathyroid tissue in 33 patients suspected of having primary hyperparathyroidism, blood samples were obtained before operation by catheter from the small veins of the thyroid venous plexus. Parathyroid hormone concentrations in the sample were determined by radio-immunoassay. The correctness of the predicted lateralisation was confirmed in all 21 patients who were operated on. A unilateral hormone gradient was seen in patients who had a single adenoma ; bilateral gradients were seen in those who had multiple abnormal glands. The technic seems useful for localising the site of abnormal parathyroid tissue, for pre-operative differentiation of a single abnormal gland (adenoma) from multiple abnormal glands (hyperplasia), and it also may be helpful in establishing the existence of hyperparathyroidism in certain patients who pose special diagnostic problems.

Tuberculosis of the Urinary Tract in Cape Town

PREEZ, H. M., SAREMBOCK, L. A. AND STABLES, D. P. (*S. Afr. Med. J.* **46**: 573, 1972) from the Departments of Urology and Radiodiagnosis, Groote Schuur Hospital and University of Cape Town, comment:

A study of 65 patients suffering from urinary tuberculosis seen over a 3-year period is presented. The clinical features have been analysed and management assessed. The results have been indifferent and an attempt has been made to establish why this has been the case, together with suggestions for improvement. It was found that many of the patients presented themselves so late in the course of their illness that conservative treatment was impossible. Symptoms of persistent cystitis should always be thoroughly investigated especially in the less privileged population group, and follow-up should be relentless. Because of the difficulties encountered in drug administration and because this is an infectious disease, it is recommended that treatment should be commenced in a sanatorium on an inpatient basis.

Phlegm and Filters

RIMINGTON, J. (*Brit. Med. J.*, **2**: 262, 1972) from Mass Radiography Service, Southern Division, Manchester Regional Hospital Board, St. Thomas' Hospital, Stockport, writes:

Male mass radiography volunteers aged 40 or more were questioned about their sputum production and cigarette consumption in relation to type (filter or plain) smoked. Of 10,414 volunteers, 3,045 smoked filter cigarettes and 2,393 smoked plain cigarettes. The rate of persistent daily sputum of filter smokers (31·9 per cent) was significantly lower than that of plain cigarette smokers (37·2 per cent). A similar pattern was maintained when age and cigarette consumption were standardised. These figures are thought to understate the less injurious nature of filter cigarettes, since more than half of the filter smokers with persistent sputum developed this while previously smoking plain cigarettes.

Whatever the reasons for the less injurious nature of filter cigarettes, it seems that cigarette smokers unable to stop smoking might suffer less from chronic bronchitis if they changed to filter cigarettes.

Plasma Digoxin Levels in Digitalised and Toxic Patients

JOHNSTON, C. I., PINKUS, N. B. AND DOWN, M. (*Med. J. Aust.*, **1**: 863, 1972) from the Department of Medicine, University of Melbourne, Austin and Repatriation General Hospitals, Heidelberg, Victoria, write:

The use of a simple, specific and accurate radioimmunoassay for measuring plasma digoxin levels in patients is described. The assay, using unextracted plasma, can be performed in less than one hour. The level found in digitalised patients is between 0·5 and 2·0 ng./ml. Patients with criteria of digitalis intoxication evident from clinical and ECG examinations have levels greater than 2·0 ng./ml. In this series of toxic patients, the patient's age, the severity or type of cardiac disease, and the plasma potassium levels in the patients bore no relationship to the development of toxicity. However, the majority of the patients with digitals toxicity and high plasma digitalis levels had renal insufficiency.

Burning Sensation and Potency of Nitroglycerin Sublingually

Copelan, H. W. (*J. Amer. Med. Ass.*, **219**: 176, 1972) from the Department of Medicine, Daroff Division of the Albert Einstein Medical Centre, Philadelphia, states:

The unwitting use of deteriorated nitroglycerin confuses the diagnosis and treatment of angina pectoris. Knowledge of the potency of each tablet at the time of its use would eliminate the confusion. The clinical impression that fresh nitroglycerin causes a burning sensation that provides a practical index of potency was tested. Thirty inexperienced subjects were tested in a double-blind study with fresh and artificially aged nitroglycerin. Twenty-seven reported immediate sublingual burning with fresh drug and decreased or absent burning with aged tablets ($P < 0·001$). Surprisingly, the faint sweetness of nitroglycerin, a true taste sensation, had no value as an index of freshness. Fresh drug caused more systemic effect ($P < 0·001$), and this correlated with burning sensation ($P < 0·02$ and $P < 0·001$). Localised sublingual erythema and vasodilatation occurred simultaneously with burning, suggesting that the burning sensation indicates potency by reflecting topical activity.

Cardiac Rupture During Myocardial Infarction

Naeim, F., De La Maza, L. M. and Robbins, S. L. (*Circulation*, **45**: 1231, 1972) from the Mallory Institute of Pathology, Boston University School of Medicine, Boston, Massachusetts, write:

Forty-four cases of myocardial infarction with cardiac rupture, 88 cases of unruptured myocardial infarction, and 88 cases without myocardial infarction were studied retrospectively. The incidence of cardiac rupture in cases with acute myocardial infarction alone was 5·5 per cent while in hearts having both healed and acute myocardial infarction the incidence was 2·3 per cent. One instance of cardiac rupture was encountered in a heart having only a healed myocardial infarction with subsequent aneurysmal dilatation of the healed infarct. Although females represented only 37 per cent of the population having acute myocardial infarction in this institution, they accounted for 55 per cent of the cases of cardiac rupture. On the average the hearts which ruptured following myocardial infarction were lighter and thinner than in the control group of patients having infarction without rupture. Among the clinical correlates possibly associated with postinfarction rupture, the most significant finding in the present study is the presence of postinfarction hypertension. In the group of cases with cardiac rupture this was present in 40 per cent while in the control group not having suffered cardiac rupture the comparable figure was 14 per cent. A history of diabetes was found in 18 per cent of the cases of myocardial infraction not having suffered cardiac rupture. A similar history was found in only 9 per cent of the cases having a postinfarction cardiac rupture. This latter incidence is identical with the frequency of diabetes mellitus in the general autopsy population. There is a suggestion that early and severe atherosclerosis may cause earlier heart disease and when infarction occurs provide some protection against rupture. Of interest among the 44 cases of cardiac rupture, none of the patients had cirrhosis, in striking contrast to the 11 per cent incidence of this condition in our general autopsy population.

Acute Papulopustular Acne

Schlappner, O. L. A., Shelley, W. B., Ruberg, R. L. and Dudrick, S. J. (*J. Amer. Med. Ass.*, **219**: 877, 1972) from the Departments of Dermatology and Surgery, University of Pennsylvania School of Medicine, Philadelphia, observe:

Three male patients in the late acne age group experienced a sudden episode of papulopustular acne of the face, shoulders, and back after two to four weeks of intravenous hyperalimentation. Upon cessation of the feedings, the acne involuted spontaneously. The pathogenesis appeared to involve nutritional factors since the attacks could be specifically related to the use of a new synthetic intravenous diet in which L-cystein, L-tyrosine, and L-glutamic acid were absent.

A Preliminary Study of Drug Abuse Among Psychiatric Inpatients

Nail, LCDR R. L., Gunderson, E. K. E. and Thompson, F. A. (*Milit. Med.*, **137**: 119, 1972) from the Navy Medical Neuropsychiatric Research Unit, San Diego, Calif, 92152, observe:

As far back as recorded history, every society has possessed drugs, producing profound effects on mood and feelings. Moreover, there were always a few individuals who digressed from custom with respect to the time, the amount, and the situation in which these drugs were to be used. In this sense, the problem of drug abuse is as old as civilisation itself.

A descriptive analysis was performed on a sample of 109 naval service drug abuse cases admitted to Navy medical facilities during the first four months of 1970. More than half of the cases were Marine Corps personnel. The modal age of the sample was 20 years, the modal years of service was one year, and 88 per cent were pay grade E-3 or below (nonrated).

Approximately half the sample had psychiatric diagnoses other than drug abuse while in the military service. Of this portion, the predominant diagnosis was immature personality. Regarding the post-hospitalisation status of the study sample, 46 per cent of the Navy cases and 70 per cent of the marine cases were still on active duty as of July 1970.

The present study included only those psychiatric cases in which drug abuse was explicit and documented in terms of diagnostic classification. Further studies are needed of the extent of drug abuse among other diagnostic groups, the vagaries of drug abuse case reporting, and the prevalence of drug abuse in non-hospitalised military populations.

Beclomethasone Aerosol in Asthma

Clark, T. J. H. (*Lancet*, 1: 1361, 1972) from Guy's Hospital, London and Brompton Hospital, London, states:

Beclomethasone dipropionate has been inhaled from a pressurised aerosol by seventeen patients with asthma and has provided the only form of corticosteroid treatment in these patients for 2 to 6 months. Nine patients were not taking systemic corticosteroids when the steroid aerosol treatment was started, and eight others were transferred from prednisolone to the new treatment. The steroid aerosol seemed to exert a significant topical corticosteroid action on the airways and provided the expected clinical benefits of corticosteroids seen in many patients with asthma. The therapeutic results were confirmed by measurements of forced expired volume in one second. Basal plasma-hydrocortisone levels did not become low in any patient, and in those transferred from prednisolone the plasma-hydrocortisone rose to normal. This apparent return of adrenal responsiveness was confirmed by measuring the response to tetracosactrin stimulation in eight patients. The results support the idea that inhaled beclomethasone dipropionate acts in a similar way to systemic corticosteroids in patients with asthma but seems to have less systemic effect. Systemic corticosteroids had to be given on occasion to six patients over the period of study, and this indicates the need to compare the therapeutic potency of the steroid aerosol with systemic corticosteroids to confirm that beclomethasone dipropionate aerosal treatment does have a significant topical action.

Drugs in Cardiogenic Shock Due to Acute Myocardial Infarction

Gunnar, R. M. and Loeb, H. S. (*Circulation*, 45: 1111, 1972) from the Department of Adult Cardiology, Division of Medicine, Cook County Hospital and Hektoen Institute for Medical Research, and from the Department of Medicine, University of Illinois College of Medicine, Chicago, Illinois, write:

As a plan of therapy for shock associated with acute myocardial infarction in a general hospital and assuming that septic and haemorrhagic shock has been eliminated as diagnostic possibilities we would suggest the following:

Pain should be relieved using morphine or pentazorine, and atropine if bradycardia is present. Oxygen by mask should be administered to bring the arterial oxygen tension to about 100 mm. Hg. The airway must be examined and, if air exchange is poor and the arterial oxygen very low or carbon dioxide high, respiratory assistance and occasionally intubation may be required.

Blood pressure must be stabilised at an adequate level for perfusion of vital organs, or progression may be so rapid that death will occur before proper evaluation can be made and more rational therapy started. For this purpose we would start a norepinephrine infusion at a rate just sufficient to keep the systolic blood pressure near 100 mm. Hg. If the shock syndrome is present but arterial pressure is normal or only slightly reduced, we would eliminate this step in therapy.

Arrhythmias or heart block should be corrected by methods discussed elsewhere in this symposium.

A venous catheter should be inserted so that the catheter tip is just within the thorax. If the central venous pressure (CVP) is below 10 cm. H_2O we would begin a regimen of plasma volume expansion giving 100 cc. of ^{40}dextran over a period of 10 minutes, waiting 10 minutes, and if the CVP has not risen 1 cm. H_2O repeat the process until shock is relieved, the CVP continues to increase or is above 15 cm. H_2O, or 1000 cc. of ^{40}dextran has been given. If the patient accepts more than 1000 cc. of fluid in this manner without elevating the CVP it is most likely that some other major process causing fluid loss is complicating the myocardial infarction.

If or when CVP is above 10 cm. H_2O, and if the patient remains in shock and is hypotensive, we would add norepinephrine infusion at a rate just sufficient to bring the systolic pressure between 100 and 110 mm. Hg. If this cannot be accomplished with small amounts of norepinephrine then intra-arterial pressure must be measured since the discrepancy between the cuff pressure and actual pressure may be increasing with further pressor infusion.

If the patient is normotensive and has a CVP above 10 cm. H_2O but manifests the shock syndrome, an isoproterenol infusion should be instituted, but to use this regimen one must be able to measure intra-arterial pressure. If CVP falls, simultaneous plasma volume expansion may be necessary. If arterial pressure begins to fall, norepinephrine should be substituted. We would use dopamine first in this particular situation, but this agent is not as yet generally available.

With the CVP elevated and blood pressure stable, arterial oxygenation established, and arrhythmias corrected, if the patient is still in a low cardiac output state with continued oliguria and poor tissue perfusion, digitalisation with about half to two thirds the normal digitalising dose should be undertaken.

If a further inotropic response is needed glucagon may be added at this point. With an initial bolus injection efficacy should be established and if found helpful a constant infusion should follow. Aminophylline should be given simultaneously to potentiate the action of glucagon.

The patient who at this point remains oliguric and with a small pulse pressure may be benefited by cautious vasodilatation with chlorpromazine or phentolamine and simultaneous further plasma volume expansion.

A patient who remains pressor-dependent or responds poorly to pressors will probably need circulatory assistance. However, unless some definitive measure can be undertaken to restore or replace nonfunctioning myocardium this too will be of little benefit.

A patient who stabilises well but experiences a fall in blood pressure as the pressor infusion is being discontinued should have plasma volume expansion as the pressor infusion is decreased. The physician must resist the temptation to restart the infusion as the pressure falls, unless the shock syndrome accompanies the hypotension.

CURRENT TOPICS

I

Initial Experiences in a Mobile Hospital

N. D. TAHILIANI*, PREM KUMAR**

V. N. MITTAL***

Notwithstanding the sudden and meteoric spurt that medical education in India has received after independence, the fact remains that in 13 out of 17 States in the country, a number of primary health centres remained unmanned by doctors as on March 31, 1969 (Notes and News, 1970). That the desired impact on the health of a vast majority of our population in rural and semirural areas, in spite of three Five-year Plans has not been achieved, has been the main concern of the Government and Indian Medical Council alike. Periodically, conferences are held in which the present educational system and medical care are critically evaluated and suggestions are made to make it comprehensive in the context of needs of the community and the country at large. It has, therefore, been realised that medical education in India needs recasting to make it rural biased so that the new doctor does not find himself utterly helpless in the strange rural framework. Hence, out of the Rs. 375 crores allocation for family planning in the fourth Plan, a pilot programme to provide medical colleges with fully equipped fifty bedded mobile hospitals serving rural areas has been mooted with the aim to achieve the dual training-cum-service purpose. These units have been named as Chittaranjan Mobile Hospitals to commemorate the birth centenary of late C. R. Das.

One such unit has been attached to M.L.N. Medical College, Allahabad. It was opened on 1-2-1971. This contribution presents our experiences during initial 2¼ months of working in this hospital.

The hospital—The hospital has been opened at an establishment cost of Rs. 3,10,000/- and is situated at the campus of Handia Polytechnic and is housed in tents. It consists of 3 main wards each 14 bedded—one for the male medical patients, one for the male surgical patients and third for the female patients. Two separate tents, each consisting of four beds, are meant for maternity and isolation cases respectively. One tent is provided for basic pathological investigations, namely blood, urine, stool and sputum examination, while two tents are reserved for x-ray and dark room facilities. A 30 mA x-ray plant is installed on cement floor of one of these tents.

One main outdoor tent has a big shamiana outside to serve as waiting room for the patients and their attendants. Behind it is a dispensary-cum-dressing tent. There are separate tents for office, consultants, dispensary-cum-dressing and for teaching.

One adjoining residential quarter (brick-work building) has been converted into an operation theatre and consists of one main operation theatre room, one labour room, one sterilisation room, a small store and one cubicle as a change room.

The medical and paramedical staff reside in a portion of the hostel rented to the hospital. The nursing staff is accommodated in a small separate brick building in the hospital campus.

The hospital has been electrified and the water supply comes from the tube well of the polytechnic.

One UNICEF motor vehicle has been provided mainly for transport of student nurses, and for carrying students and interns to rural areas for preventive and social work.

Staff There is one permanent medical officer for the hospital. One surgeon, one physician, one gynaecologist and one teacher from Social and Preventive Medicine Department (all of the rank of lecturer, reader or professor) are posted for one week by rotation. One resident surgical officer or resident medical officer, three to six interns and eight students studying in the final year are posted by rotation for one month. All the staff members live in the premises for the period they are posted.

The nursing staff consists of one sister and six student nurses of S.R.N. Hospital, Allahabad who are posted by rotation for one month. Except for the medical officer-in-charge, rest of the staff is paid from the funds of M.L.N. Medical College and S.R.N. Hospital, Allahabad.

There is allocation for the following staff from the hospital funds: Two staff nurses, one x-ray technician, one pharmacist, and one laboratory assistant, one store keeper, one clerk, one driver, one electrician, five nursing orderlies, one washerman, two cooks and five sweepers.

The yearly allocation of funds for salaries were as follows: For medical officer—Rs. 7,200/-, for other staff —Rs. 19,900/-, allowance - - Rs 17,100/- and travelling allowance for whole staff Rs. 30,000/-=Total Rs. 74,200/-.

The annual recurring grant of Rs. 43,500 with break up, was as follows: Diet -- Rs. 7,500/-, medicine and dressings etc. — Rs. 12,000/- and petrol, casual labour and miscellaneous contingencies- -Rs. 24,000/-.

Hospital work — During a period of 2-1/4 months, 5,700 new patients were registered in the out-door. They were first examined by resident officer and interns. Those who needed specialist's attention were referred to the consultants as shown below: Medical specialist—approximately 250 patients per month, surgical specialist—200 patients per month and to the gynaecological specialist—250 patients per month.

221 patients were admitted in the hospital during this period as follows: Surgical—118, medical—62, orthopaedic—25 and gynaecological and obstetric cases--16.

In all 136 operative procedures (surgical—96, orthopaedic — 25, obstetric — 14 and gynaecological — 1) were performed.

The anaesthesia administered in those patients who were operated were as follows: General anaesthesia—26,

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special anaesthasia—6, caudal block—5, local analgesia—87 and no anaesthesia or analgesia—12 cases.

Teaching—The students were divided into two main groups. One group was attached each to the physician and surgeon. The students were not posted, as a routine, with the gynaecologist as the rural female patients would not even give the history in the presence of males, much less permit themselves to be examined by them. However, whenever interesting cases were encountered by the gynaecologist, the students were called and taught about those patients. The students attended ward-rounds, outdoors and operations performed by the senior doctors. They actively participated in the sterilisation and other operation theatre techniques. In the afternoons, students and interns went in the vehicle with the teacher from the Department of Social and Preventive Medicine to the neighbouring village where they conducted surveys of population, families, nutritional and sanitary conditions and also actively participated in the immunising programmes.

In the evening, seminars and group discussions were organised on subjects concerning rural problems, namely, tuberculosis, gastro-intestinal disorders, malnutrition, fluid and electrolyte balance in rural set up, obstructed labour, and economical use of limited facilities in the rural hospitals. The students and teachers participated in these seminars.

Problems The following main problems were encountered:

(1) The allocated funds for medicines being very meagre (3·87 per cent), even the basic minimal medicines could not be provided to all the patients. There was, therefore, a fair amount of discontentment amongst the patients as was evident by the fact that medical beds in the later part of this period were almost empty and needy patients were reluctant to be admitted.

(2) There were hardly any private medical stores in the vicinity. Thus, particularly in emergency, when useful and life-saving drugs were needed, a fair amount of delay in obtaining them was involved.

(3) In obstetric and gynaecological practice, usually only those patients who were complicated and in whom indigenous methods of treatment had failed were brought to the hospital. The lack of blood supply and plasma substitutes was felt more acutely. This often put a lot of avoidable mental and physical strain upon all those who were actively associated in treating the patients.

(4) In the initial stages when the whole operation theatre technique including sterilisation, carbolisation of trolleys and setting up of the instruments was carried out by the surgeon himself, the postoperative infection rate was minimal. In a controlled study, patients suffering from hernia, hydrocele and contracture of finger, etc., no prophylactic antibiotics were given without any harmful effect. But in the second month, the hospital infection rate shot up to alarming proportions of 50 per cent.

(5) Lack of trained anaesthetist compelled untrained interns or resident officer to administer anaesthesia. While no accident occured, this quite often created nerve-racking moments during emergencies.

(6) The postoperative follow-up of the patients left much to be desired. Since the operating surgeon usually left the patient behind after his period of one week's posting, he completely lost contact with the patients. While this was not much of a problem in simple cases, in some complicated cases, the patients had to come to Allahabad for follow-up by their treating doctor.

(7) The transport problems of serious and complicated patients for their shifting to Allahabad, though not insurmountable, nevertheless involved much anxiety, expense and risks to the patients.

(8) The students posted at the mobile hospital lost continuity in their regular, systematic lectures and classes.

COMMENTS

It is now well recognised that the distribution and delivery of health and medical care in its quantiative as well as qualitative comprehensiveness is lacking not only in developing countries but also in developed countries of the world. In Great Britain, recently, a Royal Commission on medical education (1968) was set up and in its report (popularly known as Todd Report), it has put a deliberate emphasis on sociological aspects of undergraduate medical education.

It is felt that the student can see what medicine is all about, only when he begins to meet patients and studies them in relation to their total environment — physical, biological, social, cultural and psychological. Young minds also quickly mop up knowledge when imagination is stimulated, and if they are put up in the rural set up not only they will be able to appreciate the situation but also will adapt themselves to the conditions existing there. The close liaison between teachers and taught during their stay in the common hostel also increases fellowship and better understanding of mutual problems.

It can also be presumed that the presence of medical specialists of the level of medical college teachers will provide a high quality of medical service to the rural community.

Thus, the basic ideals underlined in the training-cum-service project of mobile hospitals is to integrate, at the periphery, the medical education process with the medical and public facilities of the country, and thus help in making the present students rural-biased.

While camp hospitals in ophthalmological practice are very popular with Indian masses, the concept of rendering other medical services in these mobile hospitals is relatively new. Sharma (1969) has outlined his experiences with a mobile 200-bedded surgical camp hospital in Rajasthan which was established at a initial non-recurring expediture of Rs. 1,000,000 and annual recurring expenditure of Rs. 400,000. They also depended upon unspecified donations. The camp catered exclusively to the non-septic surgical problems in villages and the staff was permanent. While the allocations for our 50-bedded hospital is in proportion, they cannot be considered rational, since the nature of services rendered is different.

The expenses involved in providing medicines to the out-door and septic and complicated patients will naturally be more than in clean and uncomplicated patients. The allotted funds in our experience were so meagre that they were soon exhausted and our inability to provide free medicines to the poor villagers often left them dissatisfied with the service. The expert medical advice without drugs seemed to be unappreciated and unheeded. The follow-up study which is so important in any scientific analysis of results in a new clinical experiment too, left much room to be desired. A proper follow-up is possible with a permanent staff. The rest of our problems was due to inexperience natural in a new set up and was not insurmountable.

It is undeniable that the ultimate progress and prosperity of the nation is guided by proper plans which meet the demands of the environments in which a majority of the people live. But Indian Medical Association has rightly pointed out that we should not accept any method that is likely to endanger the health of the people or progress of future development of science. It is, therefore, in the larger national interest that the new plans are so oriented and executed that they are likely to succeed and be popular with the massess. Half-hearted measurers, howsoever well meaning they may be, are likely to meet a sad end.

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2

To Write a Paper

M. D. PATEL*

Somebody has said that if a squirrel and a guinea-pig met, somehow, somewhere, the question of tail must arise! So also with medical men who have written 'papers' and those who have not. It's a touchy subject, a prestige issue, of haves and have nots, of I have done it and you have not, of you have done it and so I must!

Broadly speaking medical writers can be divided into those who have something to write and those who must write something! Both usually haunt medical college campuses, the former as tortured souls in search of truth, the latter as desperados trying to justify their existence and claims to seniority by the sheer weight and number of the papers produced! The first group speaks for itself, but the latter needs introduction. They are either the compulsive writers or the compulsory writers. In either case, the necessity to write and inability to do so intelligently makes this, once a noble pursuit, a refuge of the destitute; all research fellowships are mere alms to the needy, and paper-writing is no more than an ugly exercise in medical journalism. We have over-sold the word "research" to ourselves and are paying dearly in terms of a horrifying paper explosion.

But write you must. Let not lack of research talent unduly perturb you. Instead, try and develop a Napoleonic temperament and erase the word impossible from your dictionary, which will now mean that not only could you always write a paper, you could do it even on impossible subjects!

As for the selection of the subject, remember that there are as many subjects in search of authors as there are authors in search of the subjects. Start nosing around the medical conferences and even if you have to watch the microphones almost blush at the poor quality of the papers read, this is probably the best place to smell one. Thumb through the latest medical journals to find out the recent trends and select a subject that will still be hot six years hence. You will need one year to write it, two years to allow the editors of different journals to sample it and reject it, and three years for it to get into print after its acceptance by one of them. Of course, you can count down on the last 5 years if you are on the editorial board of one of the Journals, a medical politician in position of power, or a top medical administrator in the Government. In the latter event, you need not even write an article. The army of subordinates will do all the work for you and you have to only gracefully condescend to put your initials below it!

Look around for the clinical materials available. Don't get dejected if you are not doing pancreatectomies. Paracentesis will be just as fine. By now you must have got the hunch. All you need now is to develop the itch to sit down and write.

Having collected the subjects you can divide them into two broad categories. Those which you have to write yourself and those you can make others write for you. It is always safe to take the path of least resistance and opt for the second. There is nothing shameful about it because you are just doing in India what an Indian does! Take a comfortable armchair and find out the best methods of using the dogs to pull the sledge. The paper so produced by proxy, is called "The armchair paper". If you are heading a family planning unit you can get ten thousand cases analysed by way of age, sex, the average age of the candidates, the number of children and their sexes when the operation was performed, their rates of failure and the reasons why.

To yours and everybody's surprise the surgical clerks will find that (a) all who were operated for vasectomy were males. Incidence of tubectomies in women was 100 per cent.

(b) The incidence of operation on one partner when the other was already operated upon was as follows: Males 20 per thousand and females 3 per thousand.

(c) The average age of males at operation was thirty-two years 4 months 8 days 2 hours 3 minutes and 40 seconds, while that of females was 29 years 2 months 22 days 3 hours 57 minutes and 11 seconds!!

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(d) Average number of children when the operation was performed was 3·4 out of which 1·9 were males and 1·5 were females!!

(e) Apparent failures of vasectomies as judged by conception was 4 in 1000. When corrected to true surgical failures, it was 2 in a thousand. Rest were presumed to be failures of the nonoperated wives!!

(f) Apparent failures of tubectomies was 2 in a 1000 and the corrected figures of true surgical failures were same.

(g) No case of failure was reported when both partners were operated upon.

If you think that all this will look like 'Babu' work, you can give it a more scientific look by converting the same subject into "Sample survey of sexual and psychological disturbances following sterilisation surgery". Apart from looking intelligent it will have the advantage of having six 'S'es in alliteration! If 1·2 per cent had diminished libido, it will be more than offset by the 8·1 per cent who have improved their performances. If 16·3 per cent are ashamed of admitting that they were operated upon, it is more than compensated for by the 1·8 per cent who enjoy bragging about it. The rest will admit of it, if asked, and the incidence of such inquiry is 1·4 per cent and the occasions for them have been all special!

By now you must have realised that I have already produced a paper which looks fairly authentic, intelligent, painstaking and may even be revealing! And all this without moving an inch from my armchair! I dare say I can get it published in any of the fairly respectable journals without betraying its armchair character.

Another good subject for armchair strategy for a surgeon would be: "Incidence of postoperative sepsis, their causative organisms and their sensitivity to antibiotics". It will be bad for the house staff, the bacteriologist and the bacteria, but good for the antibiotics and you!

If you possess a little good luck and the sense to know when it has arrived, you can safely fall back upon reporting 'interesting' or 'rare' cases. Hitch your case to the recorded knowledge in the books or somebody's previously reported case and the paper is ready! If you have innocently removed a nodule from the ear cartilage which is now reported eosinophilic granuloma, don't throw away the chance. If you are the sixth to find it out in a cartilage, you may still be the first to have it in the ear cartilage. And if somebody has already reported it in the right ear, you may still be first to detect it in the left! And if somebody has done even that, you may still be the runners up!

Preparing "comprehensive reviews" is another painless passage to authorship. Best time to do it is when you are bursting with swallowed knowledge, which usually is after passing a postgraduate examination. The most convenient place to copy them down is the medical college library where they are available ready made in all sizes and shapes. Difficulty about publishing it can be surmounted if you send it to an editor of an obscure journal publishing mostly pharmaceutical advertisements with thinly interspersed medical articles to justify its name.

If you can't do even this much, I shall feel sorry for you but you must not. There is still an easy, but a rather fishy way out. Write to pharmaceutical concerns about clinical trials justifying the claims of some of their suspect products. The snag is that you may have to build up the statistics around preconceived conclusions. But this is more than offset by it being heavily subsidised, and if the company publishes its own journal, you have an assured publication, with of course some risk of facing a rather non-assured audience.

Another standard method of getting into print a half-baked material is to come out with a 'preliminary report'. You may appear to be in a little undignified hurry but it has the advantage of early publication and making everybody feel that the stuff was so good that there was a chance of somebody pinching it! Best, of course, is that you are not obliged to publish the full paper later on and chances are that it would have been unwise to do so!

To have an aromatic smell of a co-operative venture, it is fashionable nowadays to publish articles in the name of all the members of the team, with that of the last man on the ladder appearing first. It fools everybody and usually the glory goes to the boss. Nobody recognises the junior author sandwiched between the senior and more junior ones. If you are the chief with talented assistants, pass the charitable order that henceforth all papers published by the unit will be joint publications. The rest is simple!

If you feel that you have the talent but not the material to work on, join a public institution, preferably Government, where research is a measure of all things including 'man'. He is meant for research and trimmed accordingly. It is the only place where, for relief of pain, you can think of bisecting a case of advanced cancer in the pelvis at the level of 3rd lumbar vertebra, escape murder and be glorified for the foolishness!

Remember that no straightforward observation, however sound, will ever be accepted for publication unless it is shrouded in statistical mysteries. If you tell them that in perianal abscesses the anal sphincter is relaxed, rather than in spasm, as is popularly believed, and that you have confirmed this by honest P.Rs done on a thousand cases over long years, nobody will publish it. But if you use manometric balloons to measure the pressure changes, and electromyograph to record the contractions of the sphincter, and chart and graph them convincingly, the only thing now left to make the whole thing look damn honest is to be apologetic about the seven cases which did not co-operate with the experiment and were therefore not included in this series! Photographs add to the prestige of the paper a great deal. Have one of the Foley catheters, the other of the manometer, the third of the two assembled together, the 4th of a normal anus and 5th with an abscess, the 6th, 7th and 8th in the 1st, 2nd and 3rd stage of the delivery of the distended balloon through the anus, and the 9th showing the end of the experiment with the Foley catheter lying prostrate on the table alongside the toppled manometer, and you standing beside them! You may even photograph the cranial end to record the effects of the excitement of the 7th nerve when the balloon is pulled out to give a visual proof of what you have just proved statistically, and of which you long back knew clinically. The only chance of this paper being rejected is on the grounds of too many photographs. But you can always subsidise it by contributing towards the expenses of the blocks! Remember that research has always been a costly affair!

If you have manoeuvred a research fellowship of this M.R. or that M.R. (Medical research) and yet lack a subject, I will give you one. Write on "Urinary excretion of 17-ketosteroids in prominent people who count". It is the right type of subject for such fellowships and urine donors will be in plenty. There many be beseeching or even threatening letters from some whose urinary samples you have forgotten to request! To make it prestigeous, declare it to be an international project, but as soon as enough national samples have been collected, back out from your international commitments on grounds of import restrictions on foreign urines!

And one final hint. If you want your article to be widely read, don't be apologetic about the short series and inadequate follow-up. Let it gradually betray itself as it is read. And don't write the summary. Some discriminating readers have a habit of reading such articles backwards, and may decide to skip the rest! There is still one 'don't' left. Mr. Punch's advice to a man about to get married was "Don't". So is mine to you. Don't write if you can help it and have nothing to say.

By now I know you already possess a paper and the problem of publication must now possess you. Aim high but don't send it to a foreign journal which, most probably, will aim low on you with a rejection slip. For home editors, you will have to have partly a political approach. In a journal from your home town or home State, local patriotism might prevail. If you can decipher the names of the editors and if you possess a matching one, it might work. Chatterjee will match with Sarkar, Karnik with Sathe, Bhai with Bhai, Chand with Chand and Singh with Singh! Look out for lean hungry looking journals where anything will do! Use personal approach and tell your friends to tell his friends, to tell the editor. There is a back door approach through the kitchen also. Find out his interests in medical politics, and take up a pose from which the editors can expect help from you. Then bargain on a reciprocal basis.

If you still do not succeed, remember what Oscar Wilde told Sir Lewis Morris who was complaining to him that every poem of his was being rejected by the press and he called it a complete conspiracy of silence. "What should I do, Oscar?", he asked. "Join it", was the prompt reply

NOTES AND NEWS

S.T.M. Calcutta, Invites Applications for D.L.T. Course

The course of instruction for Diploma in Laboratory Techniques covering one year of whole-time study will commence at the School of Tropical Medicine, Calcutta on 2-4-1973. Science graduates with chemistry or physiology are eligible for admission. The course provides a comprehensive training in the modern methods and investigative techniques employed for the diagnosis of various diseases. Application for admission to this course should reach the Director, School of Tropical Medicine, Calcutta-12 by 28th Februuary, 1973.

The following fees are payable at admission:

Tuition fee	Rs. 150.00
Caution money	Rs. 50.00

An examination fee of Rs. 50.00 is payable to the Faculty of Tropical Medicine and Hygiene, West Bengal, before commencement of the examination.

Excerpta Medica Travel Fellowship Award

The Board of Trustees of the Excerpta Medical Foundation, Amsterdam, the Netherlands, has conferred the Excerpta Medica Travel Fellowship Award, 1973, on Dr. Robert W. Rodieck, Reader in Physiology, in the Faculty of Medicine, the University of Sydney, Australia.

Dr. Rodieck, who is 35 and a U.S. citizen, is the author of the book 'The Vertebrate Retina—Principles of Structure and Function' and has published a number of articles on physiological and neurophysiological topics in the international biomedical press since 1959.

CORRESPONDENCE

The Editor is not responsible for the views
Expressed by correspondents

Passing of Capsules with Faeces

SIR,—A few days back a worried and anxious lady, came with a complaint of having passed a large whitish-looking "egg"-like object in her stool. She had passed one such the previous day and another, sometime a year before. She was asked to collect this "egg". This being very fragile broke whilst picking and so only thin bits of "egg-shell"-like material was procured.

A couple of days later, her 3-year-old son too passed one such. This was carefully collected by the father. It was oval, 22 mm. x 12 mm. whitish with a soft-shell (Fig. 1). It closely resembled a reptilian egg both in size and shape particularly that of lacerta. The shell was thin, and exuded a thick glairy yellowish fluid; microscopic examination revealed some crystalline material.

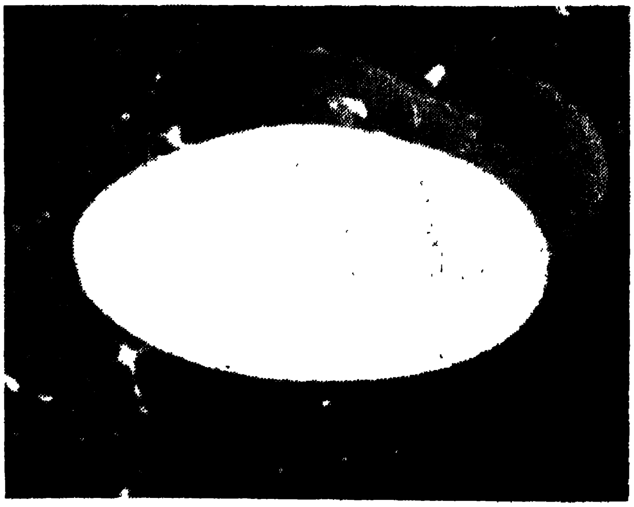

FIG. 1

This indeed kept my colleagues and me guessing what it could be? Passing insects and beetles per rectum has been reported. In cases of intestinal myiasis, the eggs of several species of flies (e.g., sarcophagus) can be swallowed with food and those that survive their sojourn through the alimentary tract find shelter in the crypts and folds and can be evacuated in any stage, larval, pupal, etc. This was not one of them.

Again our curiosity was aroused because it is also known that certain types of beetles (scarebaedae, orthophagus and caccobius) are passed per rectum. These beetles, probably, attracted by the smell of the faeces enter the rectum during sleep, and could be passed out, enclosed in a thick envelope of mucus. This too was not one of them either.

A couple of days later on questioning the father—a highly qualified pharmacist, it was learnt that he had given a particular brand of vitamin B-complex capsules to his son. At our request he was able to get a couple of these for examination.

The mystery was solved when these capsules were put in water—they swelled up to the size and shape mentioned, could resist 4 per cent hydrochloric acid and 2 per cent sodium hydroxide but disintegrated in 4 per cent sodium hydroxide and these were passed days after swallowing one.

I wonder if any other medical practitioner too had such a problem. This certainly kept the poor mother worried and upset till the mystery of the "egg" was solved. I wonder too how our Drug Controller Department let pass such capsules without any mention that these are likely to be passed per stool as such.

I am, etc.,

Kasturba Medical College,
Manipal

K. N. A. Rao, B.Sc.,
M.B.B.S. (Mys.), Ph.D. (Edin.)
Professor of Microbiology

Editor's comment

The passing of capsules with faeces is frequently observed with various drug preparations.

Tetanus among Western Railway Employees

Sir,—I have read with interest the article entitled 'Incidence of Tetanus among Western Railway Employees with Special Reference to Prophylaxis' by S. L. Malhotra (*J. Indian M. A.*, **59**: 92, 1972). May I request the author to clarify the following points:

1. How has the author ensured that all cases of tetanus among railwaymen and their families were treated at the railway hospitals/health units and none went to a non-railway medical facility?

2. When was the census in connection with the National Family Planning Programme carried out? Did it cover the entire population or only a part of it? In case it was carried out during a period other than the study period, and/or it covered only a part of the population, how did the author ensure that the study population had the age and sex-composition during the relevant period (1961-65) as disclosed by this census?

3. The author's conclusion that the peak incidence was 45.7 per cent of the male and 15.6 per cent of the female in the decade 0-10 years is not borne out by Table 2 which shows that this decade had 38 and 13 cases out of a total of 53 and 30 cases among males and females respectively.

4. The author's conclusion that the incidence of tetanus among railwaymen and their families was 1/60th the incidence among non-railway population living in the same areas is based on Table 4 which gives the age- and sex-wise distribution of cases among the two populations during a period of one year (1965) in 10 towns. In 6 of these towns the incidence is not comparable because the tetanus cases among the nonrailway population included cases from the surrounding rural areas. His conclusion is evidently based only on the remaining 4 towns.

(a) Did the author ensure that these remaining 4 towns did not similarly include rural cases? (b) Even if they did not, the railway incidence was not 1/60th of the non-railway incidence. How has the author arrived at this ratio? (c) The population at risk in the 10 selected towns has not been stated. Then how were the incidence rates calculated? (d) If the population at risk in these towns was based on the census figures (1961) how was the population at risk during the study period (1965) arrived at? ((e) The census figures do not differentiate between railway and nonrailway components of the population of any place. Was the railway population excluded from the census population in arriving at the non-railway population?

5. The author states that at one of the railway centres (Chitorgarh) covering the study population, where administration of prophylactic antitoxin was discontinued and dependence was placed mainly on wound toilet and daily administration of tetanus toxoid, not a single case of tetanus occurred among 1700 cases of injuries involving break of the skin treated at that centre during a period of six months. This practice was later (presumably after the present study) extended to another centre (Anara) on South Eastern Railway (not covering the present study population), where also no cases of tetanus occurred (among an unstated number of injured persons) over a period of one year. From this he has concluded that adequacy of wound toilet in the railway population was the most likely cause of the low incidence of tetanus among the railway as compared with the nonrailway population.

(a) He appears to have presumed inadequacy of wound toilet in the case of nonrailway population. What are his grounds for such a presumption? (b) He has himself stated that only 1 in 6003 injured persons treated at all the railway hospitals/health units during the study period of 5 years (1961-65) developed tetanus. At this rate even in the absence of any wound toilet only 0.03 (that is not even one) case of tetanus would have occurred among the 1700 injured persons treated at Chitorgarh during a period of six months. Non-occurrence of a single case of tetanus at that centre could therefore easily have been due to the play of chance.

I think the correct way to prove the supposed adequacy of wound toilet in the railway population as the likely cause of the low incidence of tetanus in that population as compared with the nonrailway population would have been (i) first, to define what is meant by adequate and inadequate wound toilet, (ii) secondly, to prove that it was adequate in the railway population and inadequate in the nonrailway population, and (iii) lastly, that the injured persons in the two populations were alike in all other respects except of the adequacy of wound toilet. In the absence of such a controlled study, it is difficult to agree with the author's conclusion that low incidence of tetanus in the railway population is due to wound toilet being adequate in the railway population (and, by inference, inadequate in the nonrailway population).

I am, etc.,

Dayanand Medical College
Ludhiana (Punjab)

A. S. Malhotra,
M.D., D.P.H., F.R.I.P.H.H.,
Professor and Head of the
Department of Social and
Preventive Medicine

* * *

Sir,—With reference to Prof. A. S. Malhotra's queries, it is stated that :

(1) Since 3 different methods were used for ascertainment of cases, it is likely that no cases were missed. In the case of railway employees, one can be sure of this because a sick certificate has to be issued whether the employee is treated in a Railway Hospital or in a non-Railway Hospital.

(2) The census in connection with Family Planning Programme covered the entire population. Even though the census was carried out during the latter part of the study, it is unlikely to create any significant difference in the age and sex-composition of the population studied.

(3) Out of the 10 towns mentioned in Table 4, 6 had cases brought in from the rural areas also; but in the remaining 4 towns, it was possible to exclude the cases brought from the rural areas, as the addresses of the patients were given in the admission registers. The population in these 10 towns was known and the incidence-rates have been calculated taking into account the population at risk. In arriving at the population at risk, the railway population was excluded from the census figures. The reason why no cases occurred at Chitorgarh seems to be the practice uniformly followed on the railway of thorough wound toilet. The same practice obtains at Anara Centre of the South Eastern Railway.

(4) The differences in the methods of dressing a wound in railway and nonrailway centres were studied by actual visits to these centres. The low rate amongst the railway employees treated at Railway Hospital during a study period of 5 years is most likely due to thorough wound toilet. A thorough wound toilet consisted in prompt irrigating the wound with 1 per cent cetrimide lotion, liberal washing with soap and water and, when necessary, debridement and covering the wound with autoclaved sterile dressing.

Since the railway and nonrailway populations were in other ways alike, adequate wound toilet appears to be the reason for very low rates of tetanus amongst railway population.

I am, etc.,

South Eastern Railway
Garden Reach

S. L. Malhotra, M.B.B.S.
(Punjab), F.R.C.P. (Lond.), F.A.Sc.
F.C.C.P. (U.S.A.), F.I.C.A.
F.A.M.S., D.C.H. (Eng.), D.P.H.
(Lond.), D.I.H. (Eng.)
Chief Medical Officer

REVIEW

Medical and Veterinary Protozoology : An Illustrated Guide —By Katherine M. G. Adam, James Paul and Vipar Zaman, 1971, Churchill Livingstone, Edinburgh and London, 24·6 cm. × 18·5 cm., pp. vii.+200, U.K. price £6.00.

The importance of parasitic infections of man and animals needs no emphasis. Of the infecting parasites, the protozoa comprise a very important group as they mostly affect the digestive tract in addition to various other tissues. The diagnosis and recognition of these infections are of great urgency and importance in developing and underdeveloped countries so that the institution of therapeutic and control measures for prevention and eradication of these infections may be possible.

"Medical and Veterinary Protozoology" by Adam, Paul and Zaman is not a textbook of the usual type but rather complementary [illegible] usual textbooks already available.

The authors have described the techniques of collection, preservation and methods of identification of the protozoa and have mentioned all the recent techniques. Beautiful photographs (which are much better than usual line drawings), some coloured pictures of autopsy specimens and microsections have enhanced the academic value of the book. This book will be a valuable practical guidance for medical and veterinary practitioners, laboratory men, and research workers in these lines.

The authors are to be congratulated for preparing this excellent work with printing and get-up of a high order.

N. V. Bhaduri

OBITUARY

Dr. A. C. Basu

Dr. A. C. Basu, an active and devoted member of I.M.A. Midnapore Branch, passed away on 3-10-72 at the age of 87. He was suffering from oral carcinoma.

Born on 5-6-1886 at Taki in the district of Khulna (Bangladesh), Dr. Basu passed Entrance and F.A. Examinations from City School and Scottish Churches College, Calcutta, respectively. He qualified for the profession from Campbell Medical School in 1907. Subsequently he took M.D. degree from Illinois University, U.S.A., in 1912. He started private practice at Burma and was later appointed Civil Surgeon in Johor State (Singapur) in 1914. Coming back to India he started private practice at Midnapore Town and over the years earned a good reputation. He was an embodiment of simple life, amiable temperament and independent spirit.

Besides being a founder-member of the Midnapore Branch of I.M.A., Dr. Basu was elected Vice-President and President of the branch for two consecutive terms. He was Chairman of the Reception Committee of the 13th Bengal Medical Conference held at Midnapore in 1953 under the auspices of the branch. He was also President of the local Brahma Samaj till his death.

He leaves behind his only son, two daughters and several grand children. His wife predeceased him.

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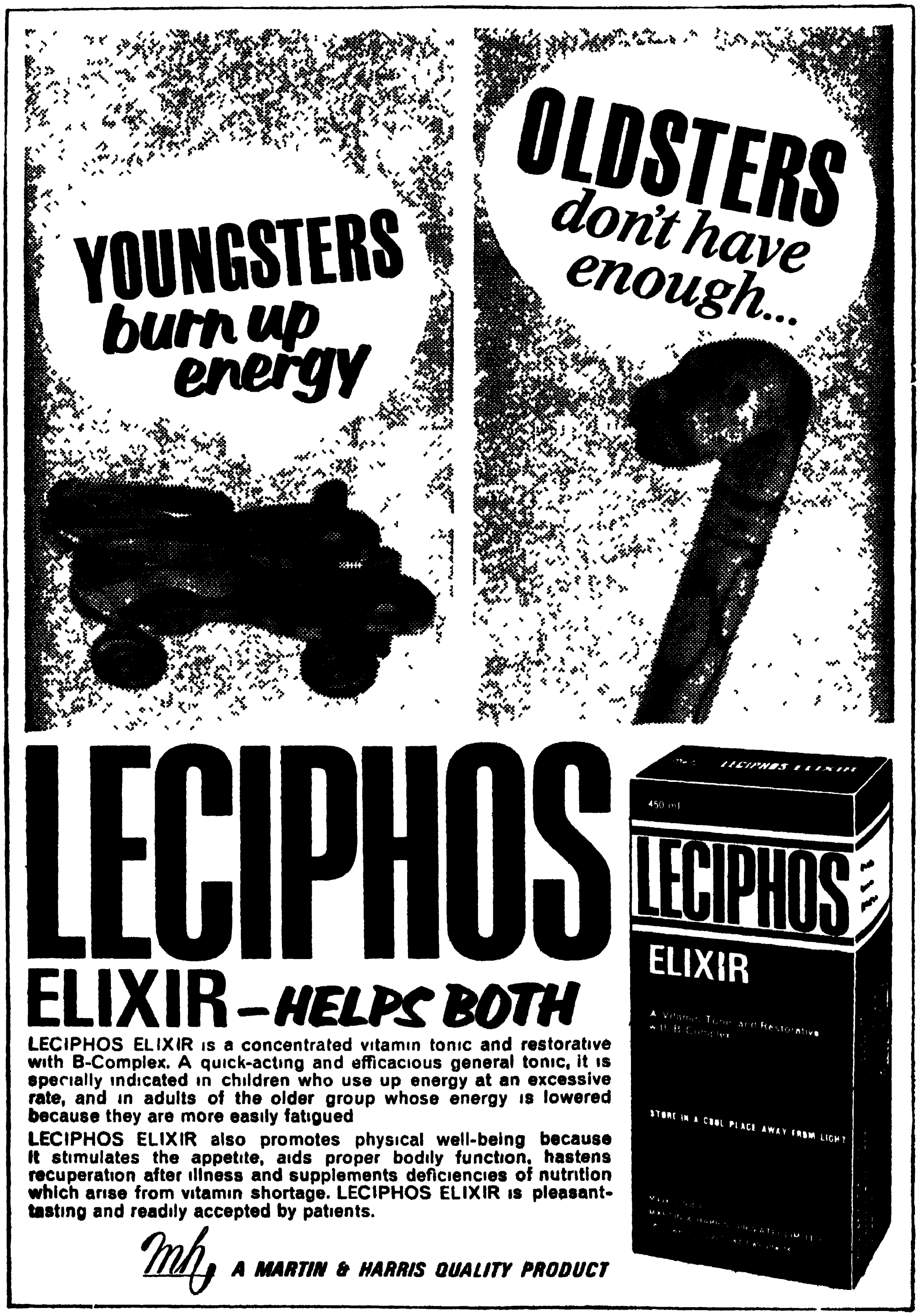

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SUPPLEMENT

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

VOL. 60, No. 2 CALCUTTA JANUARY 16, 1973

Association Notes

I.M.A.'s Call to the Medical Profession: Observe All-India Black-Day on 16th April, 1973

Dr. Deben Ghosh, Hony. Joint Secretary, I.M.A. and Convener, Action Committee, has issued the following statement in connection with the observance of All-India Black Day on April 16, 1973:

The Indian Medical Association has directed all its units to launch a campaign to restrain the Government from regularising by enactment the practice of modern scientific medicine by unqualified and untrained persons.

Pursuant to the decision of the Working Committee of I.M.A. and that of its Central Council which met at Ahmedabad in December last, all State/Territorial and Local Branches have been called upon to launch a campaign throughout the country to apprise the public of the dangers from the Government's move to bring about enactments to regularise that type of practice and to observe "All-India Black Day" on Monday, the 16th April, 1973 as a mark of protest.

For about a decade or more the Government of India has been making efforts to regularise the practice of modern scientific medicine by unqualified persons, popularly known as quacks. Whenever the move of the Government became evident the I.M.A. strongly opposed it in the very interests of the people of the land and progress of scientific medicine and national health.

About a year ago such a move was made by the Government in a subtle manner under the garb of "Rural Health Scheme" with a proposal to employ these unqualified persons to render scientific aid to the rural people. The move was resisted by the I.M.A. particularly by Dr. A. K. N. Sinha, the Association's immediate past President, while he was Chairman of a Task Force under the Planning Commission and there was a thaw.

Now the Ministry of Health of the Government of India has written to all States, it is learnt, to take necessary legislative measures to regularise the practice of modern scientific medicine by unqualified persons. In compliance with the directive the Kerala State Government has already brought a bill which is now lying with a Select Committee of the State legislature. In view of the development the Working Committee as also the Central Council of I.M.A. which met at Ahmedabad in December last issued a call to the Kerala State Branch to observe "Kerala Protest Day". Kerala State Branch has accordingly voiced its protest and sent a representation to the Select Committee of the State legislature. Kerala State Branch would soon start a dialogue with the members of the Select Committee and on the outcome of the same decide on the date of observance of Kerala Protest Day. It would be very useful if the neighbouring State Branches could send a large number of volunteers to assist the Kerala State Branch on this occasion.

The I.M.A. has further called upon the medical profession to observe "All-India Black Day" on April 16 next to highlight the opposition of the profession to a move which it believes is detrimental to national interest. Though the primary responsibility for this programme has been entrusted to the Action Committee, I.M.A (Hd. Qrs.), the successful implementation of the same depends entirely on the executives of our State/Territorial/Local Branches, their associates and the members, who have always upheld the banner of I.M.A. and the cause of the profession. Their valued suggestion, help and co-operation are pre-requisites to the fulfilment of this onerous task.

The following tentative programme has been evolved out of the suggestions received from different members and their considered opinion is earnestly awaited for finalising the same :

1. Cease work (excepting emergency cases).
2. Mass rally at different places.
3. Mass deputation and/or silent march to the legislature.

4. Press conferences, publicity through posters and leaflets to rouse public interest.
5. Socio-medical conferences to be addressed by speakers from among public representatives.
6. Wearing of protest badge.
7. Submission of protest memorandum to the authorities concerned.
8. Deputation to Central and State Governments.
9. Building of public opinion by all medicos at their own clinics amongst their own patients and other members of the public.

All are earnestly requested to help the Action Committee with their considered opinion to the items of the programme so as to enable the Action Committee to finalise them. There is hardly any time to lose. Any new suggestion for the programme is welcome from the members.

* * * *

Dr. J. Majumdar, Chairman, Action Committee of I.M.A., has issued the following statement:

Indian Medical Association, the national organisation of qualified medical men of the country has rightly called for a demonstration of protest against the move of the Government for regularising the practice of modern scientific medicine by unqualified persons which will not only not solve the problems of health care for the teeming millions of the country but also retard the progress of science. The I.M.A. has times without number placed before the Government its proposal to utilise the total force of qualified medical men for building up better health care for its people. Frequently it is projected by the Government that there is an overall dearth of qualified medical men in India and that qualified medical men do not go to the villages. The I.M.A. asserts on the basis of Government's own figures that there is really no dearth of qualified medical men in the country *vis-a-vis* the capacity of the Government to utilise them, as our experience tells us in recent years. If we look to the figures we find already about 1,37,000 qualified medical men and we have got 100 medical colleges producing every year about 13,000 medical graduates. It can be deduced from these figures that we would have more than 200,000 qualified medical men by the end of 5th Five Year Plan and the Government has declared its target for medical manpower as to have one doctor for 3000 persons. The existing number plus the number to be added in course of the Plan period, therefore, fulfils the target. Why then talk of a dearth which is not a fact ? Production, we know, is usually considered in the context of potential consumption. Should it not apply to the growth of medical manpower as well ? Should we look for the day when doctors would be brought to the same critical situation regarding empolyment as we have already had for the qualified engineers in our country ? The I.M.A. agrees of course that there is imbalance in the distribution of qualified medical men in the country and it has repeatedly offered its assistance and cooperation to the Government for removing this lacuna. The difficulties lie elsewhere. We need an adequate supply of drugs to be readily available to the poor millions of the country. We need adequate equipment, nurses and para-medical personnel. Health Units now-a-days are not manned by doctors only. There is a big shortage of nurses and para-medical personnel including health educators, health assistants for preventive work, radiographers, laboratory technicians, dressers, compounders etc. The I.M.A. urged the Government to train up these thousands of unqualified persons practising modern scientific medicines into para-medical personnel. Had this been done there would have been no need for giving any recognition to the unqualified persons, nor would there be any need to regularise their practice which is a most reprehensible step for a developing country. It was the solemn duty of the Government to ban the practice of modern scientific medicine by unqualified persons which would have been a step consistent with the law of the land and consistent with the I.M.C. Act. What good would come from registering the unqualified persons who practise modern scientific medicine? They had been there over many decades and they are still there and carrying on their avocations as before.

If the rural areas are not provided with safe drinking water the rural people will live on unsafe water and be exposed to various diseases. Does it improve matters if we call this unsafe water safe, knowing well it will positively harm their health ? People at least clamour to-day for safe water supply as they have been made conscious about the progress of science. Any motivation on the contrary will retard the progress of scientific outlook among our fellow countrymen.

THE TASK

Being guided by the national interest the I.M.A. has taken upon itself to persuade the Government to refrain from taking a retrogade step. It has resolved to apprise the leaders of the nation and the people of the fearful consequences of the Union Health Ministry's move. The I.M.A. is ready with a workable plan by which we can develop our health units even in rural areas and man them by qualified medical persons. The I.M.A. has already proposed to the Government that the methods followed by the Public Service Commission in recruiting medical officers for the Government Departments should be so revised as that least time is consumed in the process, for the inordinate delay involved in completing the official formalities discourages medical graduates to enter into service. Moreover the I.M.A. has demanded that medical officers placed in rural areas should be unequivocally assured that after 2 to 3 years they would be transferred to stations with better amenities and/or they would be provided with better opportunities for improving themselves through higher specialised education or postgraduate studies. Further it has also pointed out to the Government that these medical officers while in rural duties have to maintain their families in the urban or city areas for which they have to shoulder financial burdens in addition to the hardship they have to face in rural life, and to obviate these difficulties they should be granted some special allowances. If the philosophy and the motivation of the Government are properly oriented to the need for providing better health care on scientific lines the I.M.A. will also not lag behind in extending its all-out co-operation.

The various reports prepared by committees appointed by the Government will prove that I.M.A. is cent per cent right in its stand. Our appeal to the Government : "Do not try to mislead the people. Do not try to hoodwink. Let there be correct planning, phase by phase, to develop in the near future a sound National Health Service for the entire country, which the I.M.A. has declared as its objective".

Under the circumstances, it is the solemn duty of all of us to convey to the people for their own good the rationality of the I.M.A.'s stand as regards the move of the Government. There is no time to waste. Every qualified medical man in the country should forthwith start campaign amongst his or her patients and other members of the public, in their own clinics as well as in institutions to which they are attached, why the I.M.A. has to oppose the official move. Let the public and the medical profession unite to persuade the Government to take the path of reason and people's welfare. Our organisers for the respective regions and leaders of the State/Territorial/Local Branches should see to it that the campaign is properly planned and executed so that it becomes most intensive on *16th April, 1973*, when we would observe the "All-India Black Day". We are confident that our efforts will bring good results and serve the interest of the country and its people.

APPENDIX-I

*NATIONAL HEALTH SCHEME FOR RURAL AREAS

PART "A"—BACKGROUND

About 82 per cent of India's population live in rural areas while the remaining 18 per cent live in cities and towns. But the qualified medical manpower in the country is distributed in the ratio of 76: 33 among the urban and rural areas. This is perhaps due to the fact that the first preference in the development of medical care facilities had gone to the urban areas because of historical background and logistic advantages. This has resulted in heavy concentration of health services and manpower in the urban areas.

Till 1947, excepting a few dispensaries and hospitals on the curative side and epidemic control on the public health side, there was really no effective health service in the rural areas. After independence, health was made a part of the community development programme. It was in the year 1952 an integrated comprehensive scheme of establishment of Primary Health Centres in each community development block was launched. The health centre was to form a nucleus from which all health activities would radiate into the area. The functions included medical care, relief, control of communicable diseases, environmental sanitation, M.C.H. including School Health and Family Planning, health education and verification of vital statistics. Up to the 31st December, 1971, 5131 Primary Health Centres had been established as against the target of about 5400 Primary Health Centres for the fourth Plan. There are still 250 blocks without Primary Health Centres. 179 Primary Health Centres are functioning without doctors.

Primary Health Centres provide elementary medical service mainly to outdoor patients. Four to six attached to them are used for observation or emergency services. For better diagnostic facilities and adequate treatment in a hospital it is necessary to link the infrastructure of the P.H.C.s with hospitals to which the patients could be referred to for treatment. Very little progress has however been made towards the development of such referal services. Today the patients from rural areas have to travel long distances to reach a hospital in a district or taluka.

The Primary Health Centres were originally expected to cover a population of 60,000 to 80,000. However due to the growth in population, the PHCs and its sub-centres are not close enough to periphery and not in adequate numbers to effectively cover the increasing population in the blocks. The staff attached to the PHCs and sub-centres are able to give effective service to about one-third of the population in the vicinity of their headquarters. On the basis of the available information, over 210 blocks have population between 1·25 and 2·00 lakhs, 9 have population between 2 and 2·5 lakhs and in one block the population has exceeded 2·5 lakhs. Long distances, difficult terrain and non-availability of easy means of transport add to the difficulties of the people at the periphery.

In spite of the best efforts all these years to augment the medical facilities in the rural areas, these areas are still lagging far behind the urban areas in the matter of medical relief and care. Provision of adequate medical care and health services in these areas is the minimum commitment of a Welfare State and in view of the increasing expectations of the people in the present changed circumstances, the matter has assumed urgency. The Prime Minister in her recent observations about Health Planning has also stressed the need for increasing the accessibility of health services in rural area.

The question as to how best and how quickly this imbalance and gaps in medical care and basic health facilities in the rural areas could be remedied has been engaging the attention of the government for a long time. The modern allopathic system of medicine with its growing sophistication in methods of diagnosis and treatment needs considerable investment in its infrastructure and a large scale expansion of the medical care and health services provided by the Primary Health Centres/Sub-Centres, cannot possibly be achieved quickly due to constraints of resources. Besides, doctors trained in allopathic system of medicine are reluctant to serve in the rural areas, as they, having been trained in cities and towns where modern amenities of life are available, are finding it extremely difficult to adjust themselves to an environment entirely different from that in which they were brought up and educated. Incentives in terms of money may improve the situation to a limited extent but are not likely to lead to a permanent and satisfactory solution.

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* Proposal of the Union Ministry of Health

As against this position, there are about 3,00,000 registered medical practitioners (both qualified and unqualified) in the Indian systems of medicine, Homoeopath, Unani, etc. trained in schools or through apprenticeship available in the country. If all these practitioners are given an opportunity to serve the rural population, it will be possible to have one such practitioner for a population of 2000 in rural areas or for 3 to 4 villages. Such a practitioner will be able to give confidence to the people and through him can be worked out programmes relating to health, hygiene, nutrition and also sanitation. He can also help in family planning in fertility control. It is, therefore, proposed to introduce a scheme by which the services of these practitioners are utilised for rendering medical aid to the people in the rural areas. Such an approach may look like revolutionary and unconventional but unless some such step is taken it will be difficult to find a quick solution to the gigantic problem of providing medical relief and care to the rural areas. Even the USSR and China, which were in the same situation fifty and twenty years ago respectively, approached the problem in a similar manner. The USSR overcame this problem by creating a cadre of medical assistants who are not doctors but are called Feldsher for manning the Feldsher posts for the treatment of common ailments. China besides reorganising the country into communes and placing the existing personnel at key points, extended the training of the traditional type of doctors and started large scale training of "Bare-Foot doctors" who are mostly farmers. People in the rural areas have been looking forward to some kind of health protection measure and medical service for a long time and such a scheme, if implemented expeditiously, will bring them the much needed relief and satisfaction. It will also result in a proper and systematic utilisation of the trained and experienced medical manpower to the best advantage of the nation.

PART "C"—PILOT PROJECT DURING 1972-73

NEED FOR A PILOT PROJECT:

Before the scheme is launched on a countrywide scale, it is proposed to start a Pilot Project of the scheme during the year 1972-73. This pilot project will help to understand the different processes and difficulties involved in launching such a national scheme through the entire country. It will particularly help to crystallise ideas regarding all sorts of resources which are required *vis-a-vis* the resources which can be mobilised for the execution of the scheme. This aspect is very important because even availability of the requisite funds does not necessarily ensure the successful implementation of a scheme.

COVERAGE OF THE PROJECT:

It is proposed to start the pilot project during the year 1972-73 in all the 21 States (excluding Union Territories) in the country. The intention is to involve 29 different districts in 21 States for these pilot studies. In each district a population of about 2,00,000 will be earmarked as a pilot unit population. This pilot unit population in each of the selected districts will be as close as possible to the Primary Health Centres where there are preferably 2 doctors in position (Appendix E)*. In view of the consideration of population of the various States it would be appropriate to allot one additional Pilot unit to the States of Andhra Pradesh, Bihar, Madhya Pradesh, Maharashtra, Tamil Nadu and West Bengal and 2 additional units to Uttar Pradesh. This would mean that Pilot experiments will be organised in one district of each of the 14 different States in 2 districts of each of the six different States and in 3 districts of one state namely Uttar Pradesh. The Pilot Project therefore envisages to cover a population of 58 lakhs in different districts and States by employing 2,900 RMPs which come to about 100 RMPs per district at the rate of 1 RMP for 2,000 population.

RECRUITMENT OF RMPS:

The first batch of 2,900 RMPs will be recruited as far as possible locally from within the selected sub-centres or from the adjacent areas, on an honorarium of Rs. 150/- p.m. from August 1972 up to the end of May 1973 (10 months in all—about 16 weeks for training, about 1 week for journeys and about 6 months for actual working). The second batch of 2,900 RMPs will similarly be recruited in December 1972 for their training under the same team of teachers and in the same institutions. The services of the second batch of RMPs will also be utilised for 2 months of April, 1973 and May, 1973 within the same PHCs but different areas. This is recommended to keep up the continuity of the training and services without any break. It may thus be seen that though both the training programme as well as functioning of the medical posts of the RMPs have been provided for a part of next year i.e., 1973, these are likely to continue.

TRAINING COURSE:

2,900 RMPs are to be trained at 29 centres to be opened in different States in the existing teaching and other institutions. These training centres will be opened in August, 1972. The centres will be run by 58 whole-time qualified teachers specially recruited for the purpose, with the help of available facilities and part-time teachers and experts who will be locally available.

BRIEFING FOR TEACHERS:

These 58 teachers will be recruited and given a briefing for about two weeks in Delhi at the Central Council for Research in Indian Medicine and Homoeopathy under the direct supervision of the two Advisers in ISM and Homoeopathy.

REMUNERATION FOR TEACHERS:

These teachers will be given a pay scale of Rs. 400-950 plus usual allowances and may be appointed for nine months in the first instance from July, 1972 onwards. After the completion of the first training course, their services will be utilised for running a second course for another number of 2,900 RMPs.

COSTS:

The cost of training and salaries including allowances for the Rural Medical Practitioners (RMPs) and contingencies etc., have been worked out in detail which is given in Appendix "F".* It may be seen from this Appendix that the cost has been split up for actual Pilot Project and for conducting the training of the second batch of RMPs and assigning them duties for two months. The cost estimates of the actual Pilot Project are as follows:

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* Not reproduced here—*Editor J.I.M.A.*

	Rs. in crores
1. Training for the first batch of 2,900 RMPs (including briefing of 58 teachers)	0·46
2. Actual functioning of the medical posts of 2,900 RMPs for 6 months (December 1972 to May 1973) ...	0·84
3. The supervision and control for 6 months (December 1972 to May 1973)	0·15
Total ...	1·45

Here it may be added that if the 58 teachers already briefed and engaged for the training of the first batch of 2,900 RMPs are utilised for the training of another batch of 2,900 RMPs (from December 1972 to March 1973), the cost of the training for this latter batch will be approximately Rs. 0·45 crores.

Moreover, if this second batch of 2,900 RMPs are also assigned to work for two months of April, 1973 and May, 1973 till the end of the period for Pilot Project and within the same PHCs but for different areas selected for the purpose an amount of Rs. 0·67 crores will be further needed for their functioning of the scheme for these 2 months. However no additional amount will be needed for supervision and control. These calculations have been made in addition to the actual expenditure on the Pilot Project. Such an arrangement is highly desirable for the sake of continuity of all types of work up to the end of the period for the Pilot Project. Thus in all for the Pilot Project and connected achievements for the continuity of the scheme a total amount of Rs. 2·57 crores (Rs. 1·45 plus 0·45 plus 0·67) i.e., 2·6 crores will be needed.

APPENDIX "A"

A schedule for 16 weeks Training Course of lectures for Comrade/Doctors (Rural Medical Practitioners—Registered Medical Practitioners).

Sl. No.	Subject	Duration
1.	Introduction to the National Scheme, Elementary Anatomy and Physiology Structure and functions of Human Body—Surface Anatomy	2 weeks
2.	Concept of health, diseases, their origin and spread, common injuries	1 week
3.	Individual diseases — common ailments complaints, injuries, differential diagnosis and also how to spot cases for referal centres ...	3 weeks
	Management of individual diseases according to:	
4.	Ayurveda/Unani ... 3 weeks Homoeopathy ... 4 weeks Allopathy including first aid ... 3 weeks	10 weeks
	Total	16 weeks

N.B.: **Classes will be arranged in 2 batches (each consisting of 50 students) in 2 shifts every day with adequate arrangements for practical demonstrations in outpatient clinics — one batch in the morning and the other in the evening.**

APPENDIX "B"

The Medical Kit will contain the following medicines, and the RMPs will be taught of uses of remedies in the Kit.

1. A.P.C. tablets
2. Phthalyl sulphathiazole
3. Sulphadimidine
4. Piperzine citrate
5. Benzyl benzoate emulsion
6. Castor oil
7. Multivitamins tablets
8. Iron tablets
9. Folic acid tablets
10. Tr. iodine
11. Tr. benzoin
12. Furazolidon cream/Furacin cream
13. Tetracycline eye ointment
14. Sulphacetamide drop 20 %
15. Adhesive plaster
16. Chlorxylenol solution
17. Boric acid
18. Cotton
19. Gauge/Bandage
20. Lint.
21. Scissors
22. Scalpel
23. Forceps
24. Multivitamin drops
25. Lodochloroxyline derivative

Note: Names of Indian Medicines and Homoeopathic Medicines included in this appendix not being circulated with above list.

APPENDIX-2

Views of Indian Medical Association
on
The Proposal of Health Ministry, Government of India

A. A NATIONAL STRATEGY ON HEALTH

B. NATIONAL HEALTH SCHEME FOR RURAL AREAS

The Indian Medical Association has reviewed the above documents concerning the above two important health programmes in the country, drafts of which have been prepared by the Government of India in the Ministry of Health and Family Planning and are under consideration of the Planning Commission.

The comments and observations of the Indian Medical Association on these documents are detailed briefly as under:

A. A NATIONAL STRATEGY ON HEALTH:

In spite of the efforts made in 25 years after Independence, the medical facilities and health care in the country as a whole have not been of a nature that could provide satisfaction to any sector of the community. Whereas a lot of progress appears to have been made in the urban areas with a population of less than 20 per cent and medicare facilities equivalent to 80 per cent as existent in the country, a scant regard has been paid to almost 80 per cent of the population in rural areas.

The Indian Medical Association agrees that acceleration of the pace of health programme is urgent and imperative and a much more concerted effort, well coordinated with the socio-economic upliftment schemes and with the active co-ordination and co-operation and involvement of the entire qualified medical manpower in the country, has to be made and given the top priority if any meaningful improvement has to be planned, specially for the weaker sections. For achieving this goal, larger and larger investments are vital, specially if the disparities between our rural and urban sectors have to be corrected as rapidly as possible with a view to improving the health profile of the country.

While the Indian Medical Association heartily welcomes the objectives laid down for the 5th Five-year Health Plan, it brings to the notice of the planners as well as the administrators, both at the Central and State Governments, that not only these objectives should be realised, but reviewed from time to time with a view to fulfilling the same. The Association is of strong view that in providing the above contemplated medical relief, no one should lose sight of the available manpower in the country which has not yet been utilised fully, specially the trained medical graduates in the modern scientific system of medicine, for which there is enough scope if at all the objectives have to be followed with the sincerity they deserve. In simple mathematics, for the objectives visualised by the end of the 5th Five-Year Plan when we can project the population of the country to be 600 million with 480 million in the rural areas, the following shall have to be established:

1. Primary Health Centres — 16000 (with 2 doctors at least for each Centre and 1 PHC for 30000 population in rural areas)
2. Sub-Centres — 96000 (1 Sub-Centre for 5000 population)
3. Upgraded 1500 to 2000 Primary Health Centres with at least 4 doctors to look after 25 beds in each upgraded Centre
4. 96000 ANM's and basic health workers (1 for 5000 population).
5. Establishment of 480,000 beds in rural areas (1 for 1000 population in the country).
6. Establishing provisions for comprehensive health care —package on health services—covering curative and preventive medicine, MCH, family planning and health education, etc.
7. Adequate provision of medicines and other equipment in each Primary Health Centre and its 6 Sub-Centres.
8. Intensification of National Programme for control and eradication of major diseases.
9. Adequate provision for drinking water supply, sanitation, better working and living conditions, houses, job employment, communications, prevention of environmental pollution, etc. etc.
10. Standardisation of provision for nutrition of the vulnerable population, that is, women and children.
11. Enforcement of Health Acts with the institution of sufficient number of public health laboratories.
12. Intensification of National Family Welfare Planning Programme with a view to reaching hundred per cent eligible couples (as against 12 per cent reached so far).
13. Improvement of hospital services by adequate medicines, equipment, personnel (both medical and health assistants including nurses), etc.
14. Planning for adequate health manpower for which the needs of the community have to be assessed and medical education oriented around those needs in the training of doctors.
15. Assessment and evaluation of the needs of the community for which applied research should be given top priority.

To the defined objectives in the Government documents on "A National Strategy on Health", the following clauses need elaboration:

1. (i) Commendable proposition if funds are allotted for achieving the objectives.
   (ii) Proper staffing commensurate with the nature of work and its workload—staff being sufficient—number of medical officers, para-medical and other ancillary health workers.
   (iii) Basic health workers should better be referred to as "peri and para-medical staff."
   (iv) Proper utilisation of trained medical personnel in the modern scientific system of medicine should be given top priority and to meet the objectives as outlined in the documents, the cadres of the medical officers, both in the Central and State Governments, must be immediately revised and substantially increased. No medical man graduating from the medical colleges be kept out of job and the utilisation of the existing unemployed and under-employed doctors be immediately planned before any other scheme is brought forward to man the posts in the PHCs.
   The Indian Medical Association feels that the properly qualified and registered medical practitioners of indigenous systems of medicine be utilised in a separate scheme with their working in their own systems respectively without their being given training and/or allowed to practice modern scientific system of medicine.
   For the utilisation of the medical manpower during the 5th Five-Year Plan, the Indian Medical Association's scheme is enclosed (Annexure) which would adequately meet our rural needs.
   (v) The objectives should be to provide also for the necessary supra and infra-structure for the hospital beds.
   (vi) Practical steps should be taken to integrate all health provisions to make it a comprehensive health care and welfare scheme.
   (vii) The entire scheme and planning will depend upon the provisions made in the budgets of the Central and State Governments. The health outlay has to be very substantially increased if the objectives have to be achieved and top priority should be given to the financial resources being made available to correspond to the increase in the medical facilities as planned. These facilities cannot be developed overnight and the phased programme has to be adopted.

2. Achievements envisaged in the growth rate as a result of the National Family Welfare Planning Programme appear to be pious desires. But, the experience, as has been brought out in the recent census, will set us thinking as to how to achieve these objectives, for which an assessment and evaluation of the entire family welfare planning programme set-up has to be made with a view to streamlining it and evolving practical schemes to reach the cent per cent eligible couples. For this, the Indian Medical Association suggests a Task Force of private medical practitioners, specially in the rural areas, who could be involved in the scheme on suitable remuneration for motivation as well as providing services by those who are trained or who are encouraged to get the necessary training for the adequate facilities to be provided.

3. National programmes for control and eradication of major diseases must be intensified and no longer should they remain Government programmes. Instead, all such national programmes should be people's programmes with participation of all those who can help in such programmes. The most important persons to help are the qualified and trained medical personnel outside the Government employment. Therefore, the Government must seek the support of such doctors. In fact, there should be total involvement of total available medical manpower, both doctors and peri and para-medical staff, for all public health measures which should be co-ordinated programmes rather than programmes conducted by one set of officials.

4. The objectives are very promising and stress has to be laid more on implementation than on schemes. Until and unless the funds are made available for the social upliftment of the rural population in particular in all matters of sanitation nutrition, public health, health education, environmental hygiene, comprehensive health care, etc. etc., no progress can be achieved in piecemeal schemes implemented in parts only. At the outset, each State should have sufficient number of public health

laboratories with a minimum establishment of at least three laboratories in each State as a priority measure.

Whereas laws for food adulteration, drugs, etc., are there, there is very little inspection staff with but negligible enforcement of the various Acts and prosecution of the guilty. The urgent need is to intensify enforcement of drugs and food laws in the larger interest of the public health.

5. The objective is very ambitious and the need for specialists services will depend on the upgrading of the Primary Health Centres and other institutions. The para-medical staff (including nurses) has to be of the standard as outlined, but enough attention and finances will have to be made available to reach the objectives to have 600,000 beds in the country (one bed for 1000 population), out of which 480,000 beds will have to be provided in rural sector by the end of the 5th Five-Year Plan The target does not appear to be very practical in view of paucity of specially trained health personnel to serve as para-medical staff and specially when funds are so inadequate for the purpose.

Institution of convalescing homes, mental hospital and psychiatric clinics is commendable provided funds are made available and personnel employed.

6. The target should be realistic in the matter of qualified and trained doctors in the modern scientific system of medicine and the Indian Medical Association suggests one doctor for 3000 population to be achieved at the end of the 5th Five-Year Plan. With 137,000 doctors at the end of the 4th Five-Year Plan and 13,000 qualifying every year thereafter, in five years the total figure would be 2,02,000 doctors which will be enough to man all possible health centres/hospitals in the country.

The need for change of curriculum is strongly felt and the teaching and training in medical colleges should be need-based, that is, community medicine should be stressed and at least 60 to 65 per cent of the graduates must be adequately trained in serving the needs as doctors of first contact/general practitioners/family physicians/medical officers. Training for post-graduation should correspond to the needs for such services if and when the P.H.C.s are upgraded, hospital beds installed, departments of hospitals upgraded, new institutions and hospitals set up.

The question of utilisation of available medical manpower must be looked into critically to avoid "brain waste."

Opening of new medical colleges as per the targets should be strictly gone into and if need is felt for opening new medical colleges, admissions in the existing medical colleges must be restricted to a maximum of 100 per year. This would not upset the present doctor-population ratio and would meet the target of one doctor to 3000 population by the end of the 5th Five-Year Plan

The question of institution of short-term course in medicine has to be critically reviewed in the light of the above available medical graduates and institution of diploma course will be adding fuel to the fire and multiplying problems of compartmentalism in medical education, different status and cadres of payments and possibly reinstitution of condensed MBBS courses in the years to come. A decision once taken at the Central Government level to have medical graduation as the minimum qualification in the country should not be lightly discussed. There is no scarcity and there is none likely to be till the end of the 5th Five-Year Plan in the matter of qualified doctors in the modern scientific system of medicine and the apprehensions of pressing into the question of more and still more doctors will not be right and, in the view of the Indian Medical Association, any deterioration in the standard of medical education will be a retrograde step.

The para-medical staff needs have to be assessed in the light of the objectives and a minimum of 120,000 to 150,000 trained health assistants in various fields have to be made available and measures should be taken to have such personnel available for manning the various projects visualised in the National Strategy on Health.

A basic science course for such type of health personnel is a necessity.

7. The stress should be laid on the applied research to assess and evaluate the needs of our country with suitable suggestions for implementing programmes conducive to the Health Strategy in the country. Whereas fundamental research is of significant importance, only selected programmes should be taken up as a long-term measure to help in the National Health Planning.

B. NATIONAL HEALTH SCHEME FOR RURAL AREAS

The Indian Medical Association is totally and fundamentally against the proposed Scheme to achieve the above objectives. Whereas the qualified and trained medical practitioners in indigenous systems of medicine may be utilised in specially prepared schemes as pilot projects with the objective of providing relief within the scope of their individual systems, no "cocktail" or mixing up of the systems be allowed under any circumstances.

The Indian Medical Association is totally against the continuance of practice of medicine by the unqualified quacks who are neither educated nor trained nor qualified, but are dabbling in the system of medical science illegally and unabated (in spite of the penal clauses in the Indian Medical Council Act, 1956). Their being labeled as Rural Medical Practitioners with abbreviation "R.M.P." will be nothing but throwing dust in the eyes of the people who consider R.M.P. as a Reg'stered Medical Practitioner of modern medical science Their backdoor recognition is bad ; their involvement in rural medical relief is worst. Their place is only as health assistants and no amount of training as envisaged in the Scheme can give them adequacy for treating human life as Rural Medical Practitioners. If they are motivated, they must be mobilised into taking up positions as health assistants in fields where they can be given intensive training before being employed.

The Indian Medical Association questions the figure of 300,000 such type of practitioners in the country. If they are functioning or employed in private practice, what agency can uproot them to make them go to villages to take up jobs @ Rs. 150/- per month? To our mind, the only explanation will be that a new class of such people will emerge who will take advantage of this "benevolence" of the Government to come forward to man the health posts after the arbitrary and sketchy training. Has it been assessed that the rural population wants this type of third-rate medical aid? Has it been assessed that the rural population wants only indigenous systems of medicine and how much? Has it been assessed that the rural population is equally aware of the modern advances in technology and expect and demand the best that is made available to the urban population?

Attaching such type of unqualified rural practitioners to a Primary Health Centre doctor will be the most irresponsible act whereby the poor doctor will be subjected to all indignations and public wrath. Who will teach whom to prepare "Instant Doctors?" Is the intention of the Government to employ qualified and trained medical men for teaching such type of unqualified persons or is the intention to have "senior" and "experienced" unqualified people to teach the unqualified?

The cost of such type of training programmes can be met if the Government of India is over-flowing with finances. Certainly the finances could be utilised in a much better scientific manner which should produce results and satisfies the rural people and not turn out to be a permanent liability with the proposed financial outlay of Rs. 150 crores in the first three years, Rs. 62 crores in the fourth year and Rs. 56 crores annually thereafter on the maintenance and "preservation" of this lot of so-called Rural Medical Practitioners.

It is futile to project anything about the training programmes, medical kit, manual, etc. and the pilot projects planned since, in the opinion of the Indian Medical Association, such type of planning is today obsolete, uncalled for, retrograde and would serve no useful propose except providing employment at the cost of the Government exchequer.

The Indian Medical Association has, instead, a very modest scheme for utilisation of the medical manpower in the first three years at the rate of 10,000 doctors per year and the details are given in the enclosed scheme. This scheme will be useful to the rural population and would meet the objectives of the National Strategy on Health and would be economical with but little infrastructure as in the proposed Rural Health Scheme. What is needed is providing finances and going ahead with the scheme. A trial of three years under that scheme will not only prove the point, but will also pave the way for bringing nationalised health services in the country.

If the Government can afford the finances for the "brilliant" Rural Health Scheme, they can certainly afford one-third the amount for the proper scheme for providing medical aid to the rural population. The Government of India can also think of adequately employing doctors on part-time basis if whole-time employment be not possible at the moment, and the Indian Medical Association has its suggestions on the same, whereby more doctors can be involved with less administrative expenses on the part of the Government. Instead of unqualified people being paid remuneration, why not think of giving 33 per cent of the total medical mapower in the country (totalling about 40,000) an adequate honorarium to put their shoulders in the National Health Programmes with their attachments through the P.H.Cs/Sub-Centres/institutions/hospitals.

APPENDIX 3

II—Recommendations of the Working Groups of the Task Force appointed by the Planning Commission

II-1. MEDICAL MANPOWER:

The Working Groups discussed at first the problems of medical manpower in the country at the end of the Fourth Plan and at the end of the Fifth Plan. They recognised that at present, the problem of manpower is more of uneven distribution than of great shortage. The reasons are:

(i) 70 per cent of available hospital beds in the country are located in urban and only 30 per cent in the rural areas. On the basis of population concentration, this should have been the reverse.

(ii) The medical education is not oriented towards the needs of the country. The emphasis is on "hospital care" and not on "community care". This has also to be reversed.

(iii) Absence of basic facilities in rural areas such as primary health centres. This includes paucity of funds, drugs, equipment, indequate transport facilities, shortage of para-medical staff and lack of adequate accommodation and absence of good hospital where patient's care can be effectively undertaken.

Even today, the available medical manpower can be evenly distributed population-wise provided certain realistic steps are taken. It was estimated that at the end of the Fourth Plan, there would be about 1,37,000 qualified doctors in the country. They discussed at length the targets to be fixed with regard to optimum doctor-population ratio at the end of the Fifth Plan. The Bhore Committee had recommended the optimal ratio of 1:2,000 and the Mudaliar Committee had recommended 1:3,000. After taking into consideration various constraints, such as financial and physical, it was estimated that one doctor for 3,000 population would be realistic at the end of the Fifth Five-Year Plan.

It was also noted that there would be 2·75 lakh practitioners of indigenous system of medicine and 47,000 practitioners of integrated medicine in the country at the end of the Fourth Plan.

The population of India at the end of the Fifth Plan is estimated to reach 600 million. On the basis of one doctor per 3,000 people, the country would require 200 thousand doctors at the end of the Fifth Plan. As there would be 1,37,000 doctors at the end of the Fourth Plan, the country would, therefore, need another 63,000 doctors at the end of the Fifth Plan. It is expected that at the end of the Fourth Plan, we would be graduating 13,000 doctors per year. In five years, there would, therefore, be 65,000 doctors available. These 65,000 doctors, in addition to 1,37,000 doctors already existing at the end of the Fourth Plan, would give a total figure of 2,02,000 doctors which should be adequate for our needs. Taking into consideration, an average attrition rate of 2·5 per cent, the actual number of doctors available would be 1,97,000. This gap may easily be made up by temporary registration and deployment of 13,000 interns during any given year. In fact, if this scheme of utilising the interns in the District and Sub-Divisional Hospitals and large health centres is given effect to, there would be surplus of trained medical manpower at the end of the Fifth Plan and no other scheme would be necessary.

II-2. HEALTH CENTRES:

At the end of the Fourth Plan, there will be 5,000 primary and 46,000 subsidiary health centres. The following tables will show the number as well as the medical manpower requirement of the health centres at the end of the Fourth and the Fifth Plans:

TABLE 1—SHOWING NUMBER AT THE END OF 4TH AND 5TH PLANS

Period	*Primary Health Centres*	*Sub-Centres*
At the end of 4th Plan ...	5,000	46,000
At the end of 5th Plan ...	16,000	96,000

TABLE 2—SHOWING DOCTORS MANPOWER REQUIREMENT IN THE HEALTH CENTRES AT THE END OF THE 4TH AND 5TH PLANS

Number of Doctors		*Primary*		*Sub-Centres*
1. At the end of 4th Plan		5,000×2=	10,000	46,000×1=46,000
2. At the end of 5th Plan	(1)	14,000×3=	42,000	96,000×1=96,000
	(2)	2,000×4=	8,000	
Total doctors manpower requirement at the end of 5th Plan for the rural sector			=1,46,000	

The table for the 5th Plan has been based on the calculation of providing 3 doctors in the primary health centre of ordinary type and 4 doctors for the primary health centres of the special type with 25 beds. Sub-health centres have been provided with one doctor each. It will be seen, therefore, that we would require 1,46,000 doctors for the primary and sub-health centres at the end of the 5th Plan.

It is expected that 100 medical colleges in the country would require 20,000 doctors calculated on the basis of 200 doctors for each medical college. If we calculate that 25 per cent of our population live in cities and 75 per cent live in the rural areas, the number of doctors necessary in the cities would be 25 per cent of 1,46,000, that is, 36,500. The total of all doctor-manpower requirement would, therefore, be:

1,46,000
20,000
36,500
2,02,500

It would be seen, therefore, that if there is proper distribution of the doctors in the rural and urban areas, including the needs of medical colleges and hospitals 2,00,000 doctors (and 13,000 interns in any one year) that we except to have at the end of 5th Plan would be sufficient for our needs.

II-3. MAL-DISTRIBUTION OF DOCTORS:

The Working Group discussed about the reasons of the mal-distribution of doctors amongst the urban and rural areas and about alleged reluctance on the part of the graduate doctors to work in the health centres. It was emphasised that this mal-distribution of doctors is due to many reasons which can be remedied and the phase of alleged reluctance on the part of the doctors working in rural areas is gradually coming to an end due to natural causes. As our rural areas begin to improve in social and physical development, doctors would be willing to work without any hesitation. To correct the mal-distribution of doctors, it may be necessary to impose compulsion in the country to ensure that the doctors serve in the rural areas for a specific period of time. This should be regarded as part of National Service.

Branch Notes

BENGAL STATE BRANCH

Kamarhati Branch—The annual general meeting was held on 19-9-71 under the chairmanship of Dr. G. N. Shah. The Hony. Secretary, Dr. Mrinal Kanti Dutta, placed the annual report for the year 1970-71.

The branch had 76 members on the role at the close of the year. It had five general meetings and 9 mettings of the executive committee, besides a number of meetings of its different sub-committees during the year. It arranged two symposia on: (1) Low Back Pain and (2) Diabetes Mellitus. It also successfully observed the Health Education and Health Week Programme which consisted of immunisation campaign, school health examination, popular lectures on health and baby show. During the year the branch was also able to purchase a plot of land for constructing its building. It also framed the constitution of the branch. As per directive of the Action Committee and the State Branch, members befittingly observed All-India "Doctors in Employment" Demands Day in co-operation with the doctors attached to the E.S.I. Hospital and Sagar Dutta Hospital, Kamarhati. The branch also contributed Rs. 435/- to the Bengal Medical Relief Committee for help to the distressed people of Bangladesh.

Folowing the annual report Dr. S. C. Roy, Joint Secretary, placed the report of the E.S.I. Sub-Committee in which he high-lighted the difficulties faced by the members attached to E.S.I. Scheme due to restrictions imposed on their day-to-day work by the authorities concerned. He also mentioned the efforts of the branch to preserve the good relations between the I.M.Ps' and I.Ps'. Both the reports were adopted.

The election of office-bearers for 1971-72 was next held. Dr. G. S. Mukherjee, President, Bengal State Branch acting as the presiding officer. The following were declared elected:

President—Dr. P. N. De; Vice-Presidents--Dr. I. B. Bhowmic, Dr. H. L. Chakraborty; Hony. Secretary—Dr. S. C. Banerjee; Joint Secretaries—Dr. M. L. Banerjee and Dr. Swadesh Roy; Treasurer—Dr. D. C. Choudhury; Members—Drs. Sushil Dhar, B. K. Nath, D. P. Mukherjee, D. K. Ghosal, Sidheswar Banerjee, M. K. Dutta; Representative to Central Council — Dr. G. N. Saha; Representatives to State Council — Drs. A. C. Munshi, S. K. Nandy, D. L. Kundu and S. C. Banerjee.

BIHAR STATE BRANCH

Dehri-Dalmianagar Branch—A meeting was held on 28-8-71 in the I.M.A. building with Dr. (Mrs.) T. Joseph in the chair. It was decided to raise funds from the members for the building fund. The following were elected office-bearers for 1971-72:

President—Dr. R. Sharma; Vice-President—Drs. R. A. Upadhya, B. Prasad, H. N. Singh and B. P. Singh; Secretary—Dr. B. L. Verma; Joint Secretary—Dr. A. H. Ansari; Treasurer—Dr. R. K. Mathur; Members of the Executive Committee—Drs. (Mrs.) T. Joseph, (Mrs.) M. Pathak, Haribhusan, R. D. Narain, D. P. Singh, Asha Rani Sinha, D. Mohan Sinha; Representative to Central Council -- Dr. J. N. Singh; Representative to State Council--Dr. D. Singh and Dr. B. Ram.

Dr. D. Singh proposed a vote of thanks The members were enteratined to dinner by Dr. (Mrs.) Joseph.

Motihari Branch—The annual general meeting was held on 20-9-71 at the residence of Dr. M. A. Rahman. Dr. S. N. P. Verma took the chair The annual report was placed by Dr. H. N. Gupta, Hony. Secretary. He reported that membership strength of the branch has risen from 35 to 45 during the year. Regular monthly meetings were held and discussions were arranged on various subjects. The branch observed the health week by going through a programme consisting of exhibition on Family Planning, cultural shows and baby shows. Mr. S. V. Sharan, District Magistrate, Champaran, presided over the function and Mrs. Sharan Distributed the prizes. During the year members of the branch carried out a health examination of the students of Mangal Seminary. During the Health Week they also administered G.P.T. Vaccine to the children. The branch observed All-India "Doctors in Employment" Demands Day and presented a memorandum to the District Magistrate, Champaran, for onward transmission to the Prime Minister. As a result of the efforts of the Hony. Secretary, the District authorities had agreed to settle a plot of land near the Sadar Hospital for the building of the branch.

The following were elected office-bearers for 1971-72:

President—Dr. S. N. P. Verma; Vice-President—Dr. M. P. Verma and Dr. M. S. Verma; Hony. Secretary—Dr. Shambhu Sharan; Treasurer — Dr. H. N. Gupta; Assistant Secretaries--Drs. K. D. Singh, B. D. Pandey and A. K. Shrivastava; Members of the Executive Committee—Drs. Raghunath Prasad, M. A. Rahman, T. P. Sinha, E. H. Khan, Mahinder Prasad; Representative to Central Council—Dr. H. N. Gupta; Representatives to State Council—Drs. A. K. Sinha, M. A. Rahman and K. D. Sinha.

The following were elected members of the Land and Building Standing Committee: Dr. S. N. P. Verma — President *(ex officio)*; Dr. S. Sharan — Secretary (*ex officio*); Dr. H. N. Gupta — Convener; Drs. T. P. Sinha, S. N. Jaiswal and V. P. Shrivastava—Members.

It was resolved in the meeting that a savings account should be opened with a local Central Bank of India and the same should be operated by the Hony. Secretary and the Treasurer. The meeting closed with a dinner hosted by Dr. Rahman.

DELHI STATE BRANCH

At a meeting held on 1-10-71 in the D.M.A. auditorium, Daryaganj, the members condoled the demise of Dr. Saran Singh, an old member of the branch, of Lehana Sigh Market, Delhi. A resolution was passed conveying heartfelt sympathy to the members of the bereaved family.

The demise of Dr. K. L. Ahuja of the Delhi Cantt., was condoled at a meeting held on 22-10-71 with Dr. L. D. Mathur in the chair. A resolution was moved by Dr. R. P. Khera, Hony. Secretary to convey profound sympathy of the members to the bereaved family was adopted.

GUJARAT STATE BRANCH

Ahmedabad Branch — The following were elected office-bearers and members of the Managing Committee for the year 1971-72:

President—Dr. C. F. Shah; Vice-Presidents—Dr. S. C. Mahadevia and Dr. A. G. Amin; Hony. Secretary—Dr. Chandrakant N. Parikh; Joint Secretaries — Dr. Chinubhai M. Shah and Dr. Indravadan C. Shah; Treasurer — Dr. B. C. Amin; Librarian — Dr. M. G. Pandejee; Immediate Past President — Dr. Vasant K. Vani; Members — Drs. B. J. Damany, Devendra D. Patel, J. N. Patel, Nathubhai H. Patel, Suryakant M. Patel, Pravin K. Kanabar, Dinubhai A. Patel, Jyotindra L. Bhatt, Prabodh M. Desai, Ansuyaben B. Amin, Shashikant V. Vanikar, Pravin C. Patel, G. N. Talati, V. D. Shah, Savailal H. Patel, Dinesh P. Patel, I. G. Bhatt, Hasmukh J. Desai, P. C. Mehra, Ramesh K. Vani, Jitendra R. Desai, R. B. Mehta, I. R. Hakim, Savjibhai M. Patel, Anand S. Shah, Anant D. Kanuga, R. C. Dalal, Anil K. Bavishi, Hasmukh M. Patel, H. K. Gandhi, R. R. Shah, C. N. Vakil, Ramesh S. Shah and Shailendu K. Shah.

Baroda Branch — The following were elected office-bearers for the year 1971-72:

President - Dr. K. D. Shah; Vice-President Dr. D. T. Contractor; Hony. Secretary Dr. F. C. Contractor; Joint Secretary -- Dr. H. B. Shah; Sports Secretary- Dr A. C. Shah; Auditor - Dr. G. S. Apte.

Bhuj Branch - At a general meeting held on 18-9-71 Dr. M. M. Dalal was re-elected President and Dr. J. M. Hathi Hony. Secretary for the year 1971-72.

At a meeting held on 2-10-71 Dr Dalal submitted the annual report and the statement of accounts which were duly adopted. Dr. Dalal also placed the report of the School Health Programme undertaken by the branch during the year. The report revealed that 3,580 boys and girls belonging to 15 villages and aged between 5 and 10 were examined, out of which 2,840 students were found to be of normal health and 740 suffering from various diseases. Dr. Dalal eulogised the service rendered by the members during the cholera epidemic. Outlining the programme of activities for the next year, he suggested formation of a ladies' wing, organising an eye camp and starting a Blood Bank as earlier proposed by Dr. Sunder Shah.

The house was informed of the election of Dr. Dalal as a member of the Public Relations Committee and that of Dr. M. M. Mehta as a member of the National Plan Project Committee of the Gujarat State Branch at a meeting of the State Working Committee held at Baroda on 3-10-71. The meeting was followed by a dinner hosted by Dr. C. H. Baxi.

Porbandar Branch —The annual general meeting was held on 19-9-71 at Rankamal Guest House. Dr. H. H. Chavda took the chair. The following were elected office-bearers for the year 1971-72:

President — Dr. N. L. Roy; Vice-President — Dr. Suresh Gandhi; Hony. Secretary -- Dr. M. S. Modi; Treasurer—Dr. K. C. Parekh; Representative to Central Council — Dr. A. M. Vakharia; Member of Hospital Advisory Committee—Dr. R. A. Lakhani.

It was unanimously decided to collect Rs. 2/- from each member for the College of General Practitioners of the State Branch.

Sojitra Branch - The new branch was formed at a general meeting of the doctors of Sojitra and neighbouring localities. It started functioning with effect from 1-10-71. The following were elected office-bearers of the new branch:

President Dr. S. D. Rathod; Hony. Secretary—Dr. B. B. Shelat; Members — Drs. S. D. Rathod, R. M. Desai, G. P. Dave, M. R. Dave, C. S. Desai, B. B. Shelat and P. M. Shah

MYSORE STATE BRANCH

The following were elected office-bearers of the State Branch for the year 1971-72:

President—Dr. T. K. Dayalu; Vice-Presidents — Dr. A. V Subrahmanyam and Dr. T. Chandrasekhar; Hony. Secretary—Dr. A. J. Narendran; Hony. Joint Secretary — Dr. V. Sreenivaschar; Hony. Treasurer — Dr. M. Narasimhachar, Editor, Journal of the Mysore Medical Association Dr. V. Parameswara; Members of the Central Working Committee -Drs. N. S. Sathyanarayana, M. A. Narasimhachar and S. R. Giri Rajan; Alternative Members Drs K S. Sreenivasa Murthy, A. V. Subrahamanyam and K. Thimmappiah; Internal Auditor—Dr. M. K. Papanna.

Chikmagalur Branch The annual general meeting was held on 5-10-71 Dr. Nagaraj Gowda presided over the meeting. Sri D. B. Chandre Gouda, a member of Parliament, was present as the chief guest. Dr. Lakshmi Narayan welcomed the members and the guests. Dr. A. Narayanappa spoke on the Management of Myocardial Infarction. Dr T. Chandesekhar, Medical Officer of Health, Aldur, was felicitated on his election ac Vice-President of the Mysore State Branch. Dr. M. Narayanappa, Hony. Secretary, proposed the vote of thanks. The members and the guests were entertained to dinner by Dr A. Narayanappa.

The following were elected office-bearers for the year 1971-72:

President Dr. K. Kadirappa; Vice-Presidents — Dr. A. Yogendra Naik and Dr. H. D. Chandrappa Gowda; Joint Secretaries; Joint Secretaries - Dr. K. P. Nagaraja and Dr. M. Narayanppa; Treasurer—Dr. D. A. Bamegowda; Executive Committee Members—Drs. B. Anjanappa, H. M. Sannamallappa, T. B. Lakshiminarayana, I. K. Nanaiah, N. D. S. Acharya, G. M. J. Pais, Savithri Krishnamurthy, Sharadamma, Y. Katappa and Shanthi; Representative to State Council — Dr. S. N. Krishnaswamy; Representative to Central Council—Dr. (Smt.) Sujayachandrasekhar.

K.G.F. Branch - The annual general meeting was held on 16-9-71. The following members were elected office-bearers for the year 1971-72:

President -Dr. M. Panyamurthy; Vice-President—Dr. N. R. Deshpande; Hony Secretary and Treasurer—Dr. S. Ramakrishna; Auditor — Dr. N. Balakrishna Bhat; Representative to Central Council—Dr. B. N. Srinivasa Rao; Representative to State Council — Dr. C. Rajasekhar.

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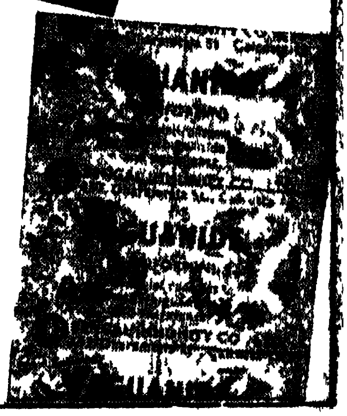

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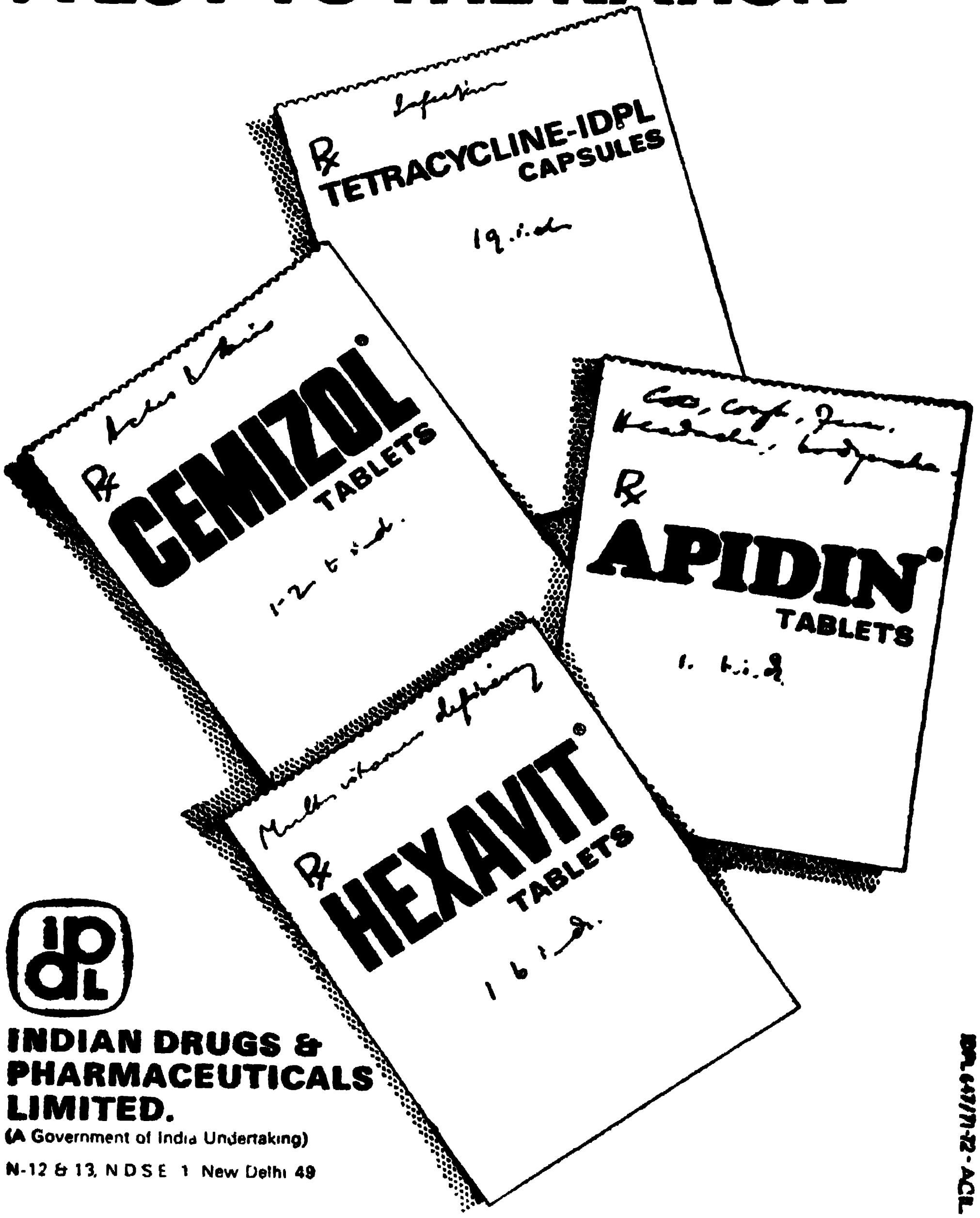

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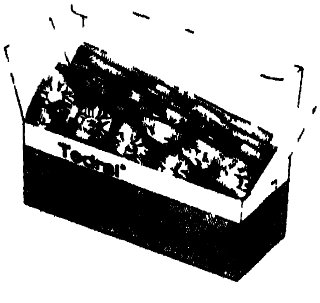

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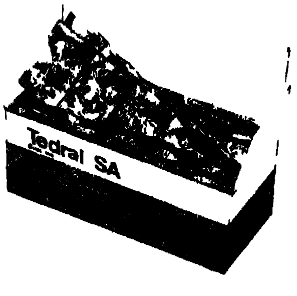

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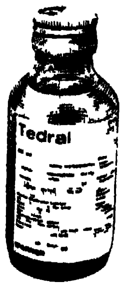

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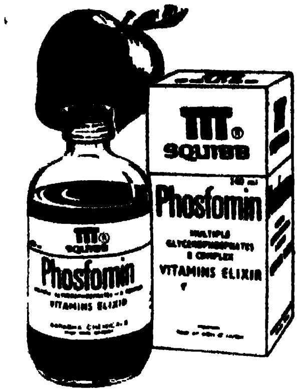

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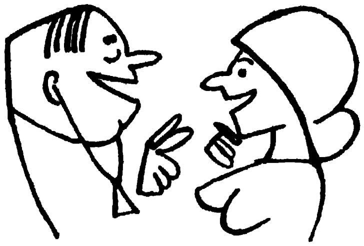

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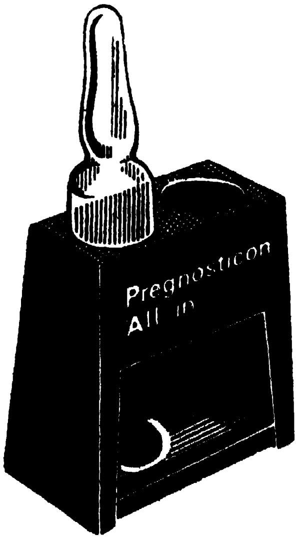

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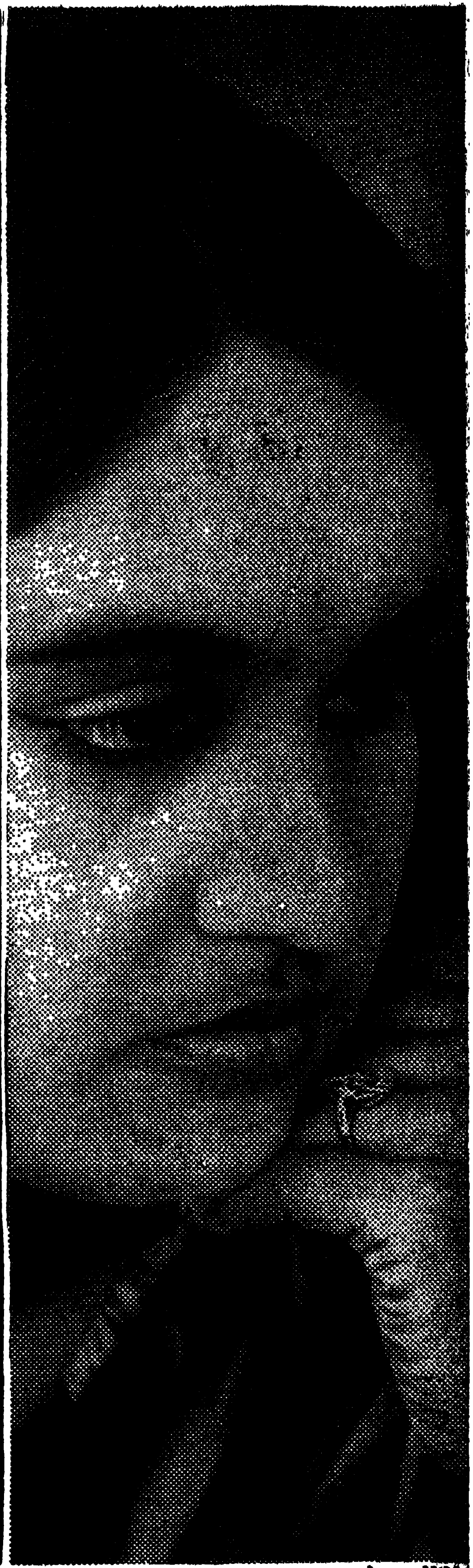

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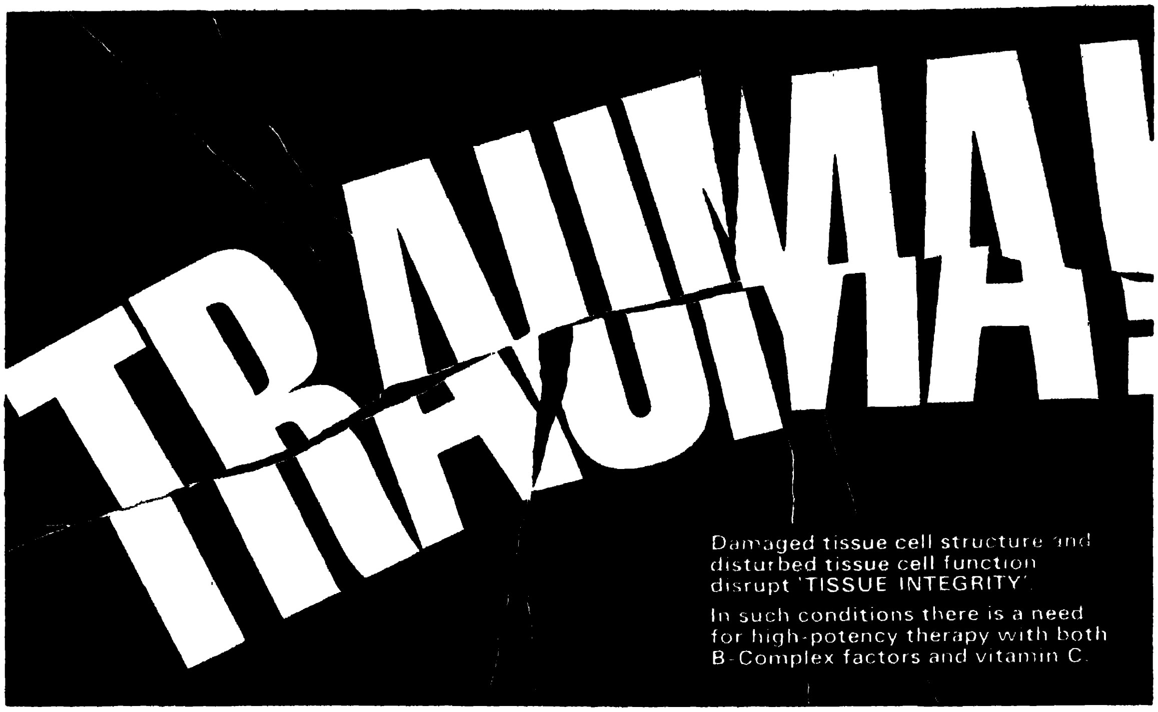

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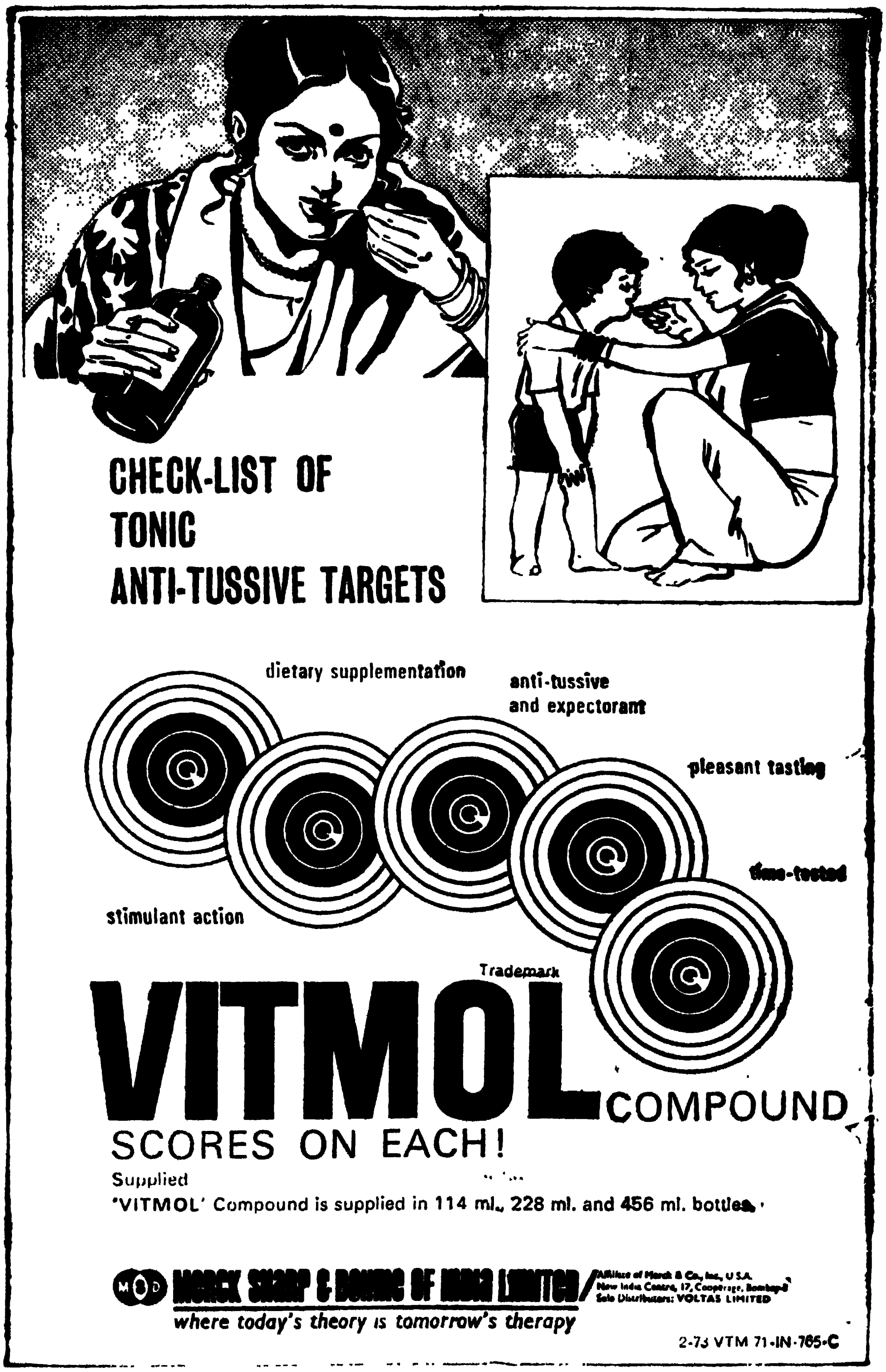

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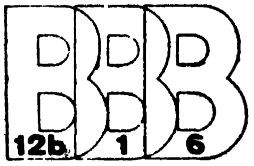

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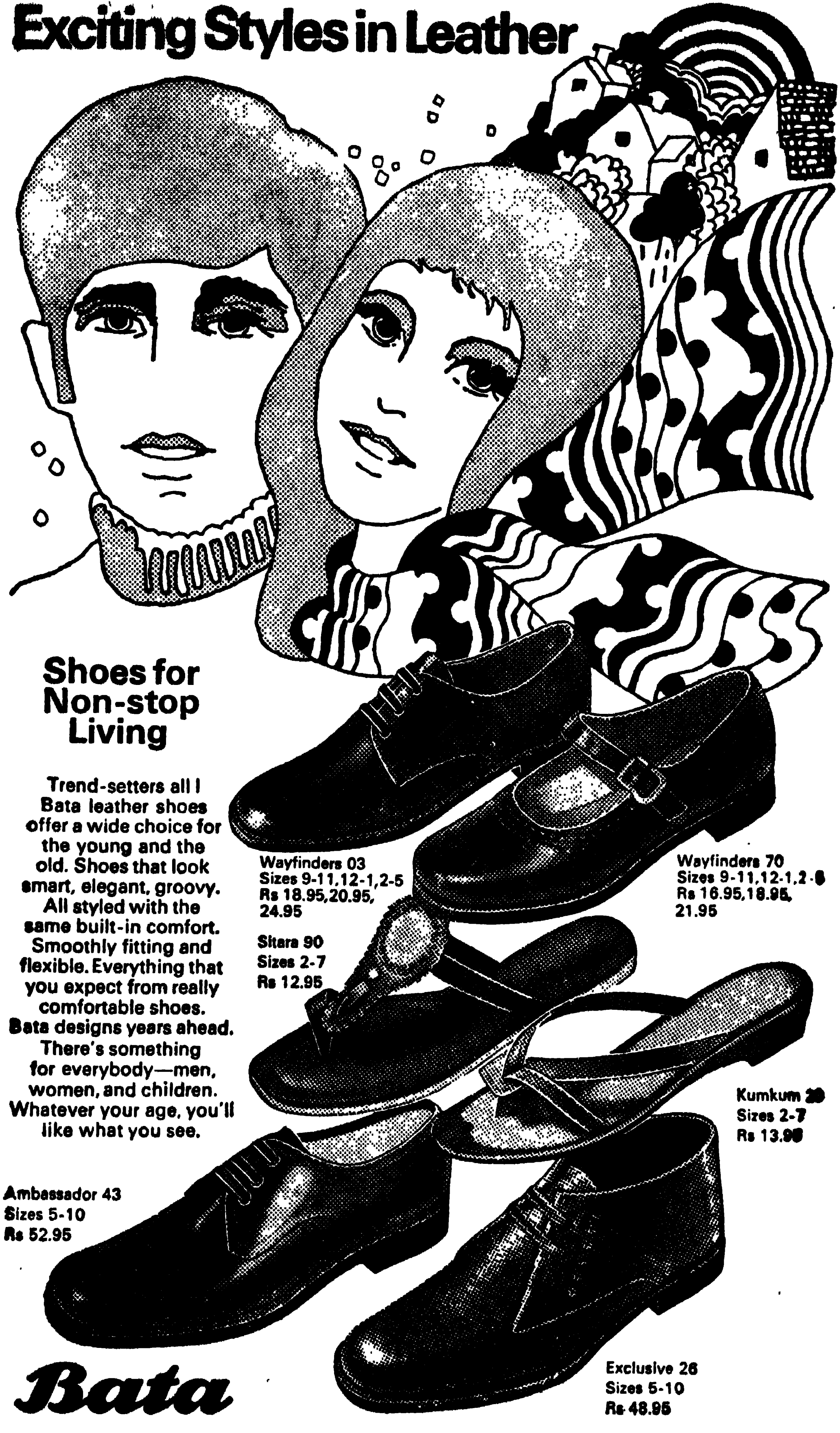

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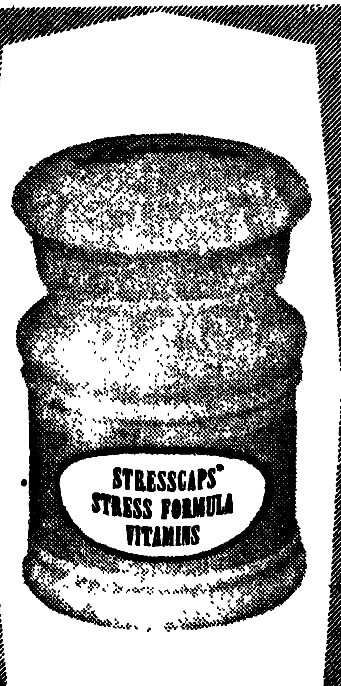

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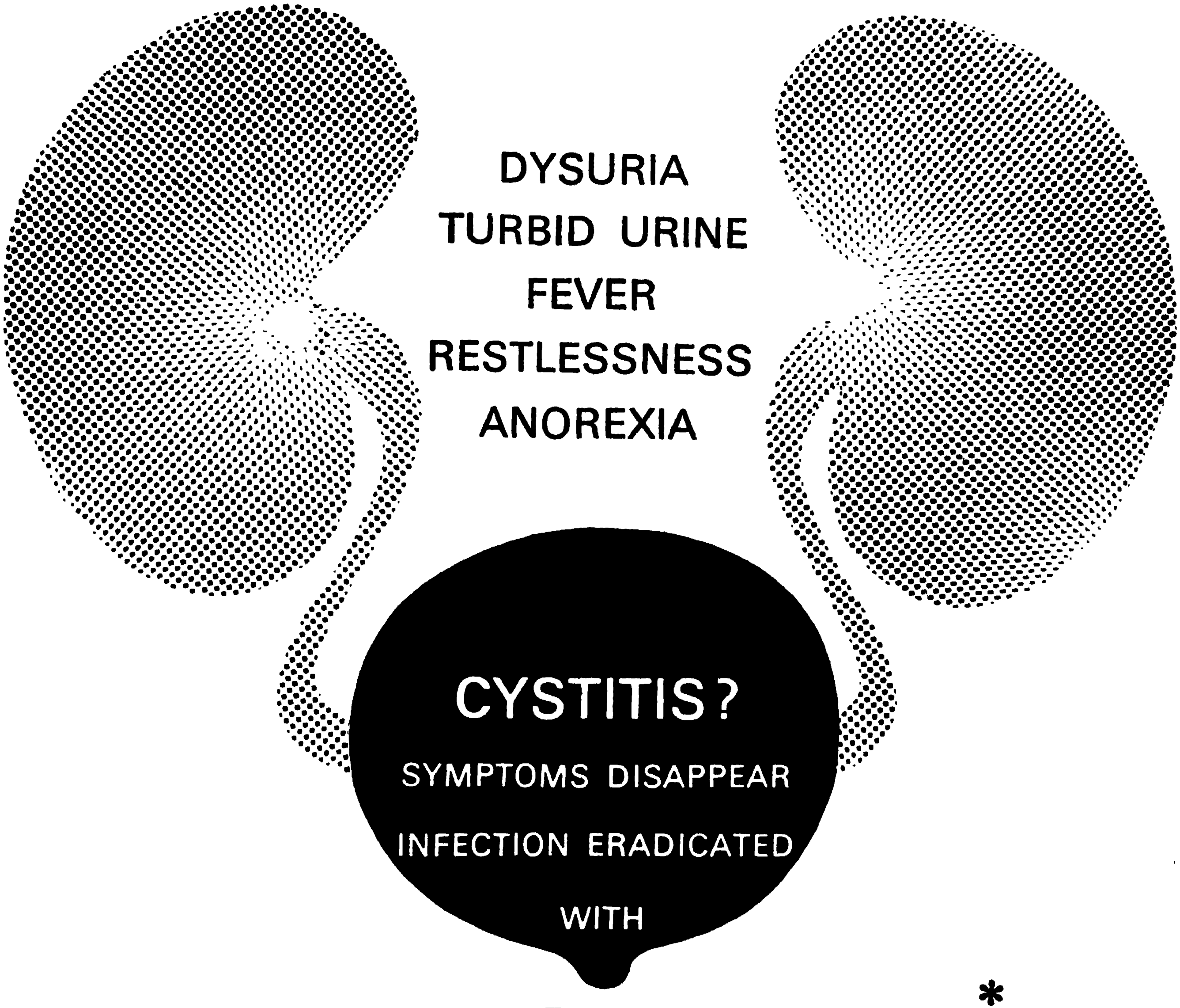

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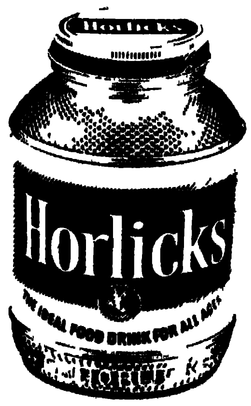

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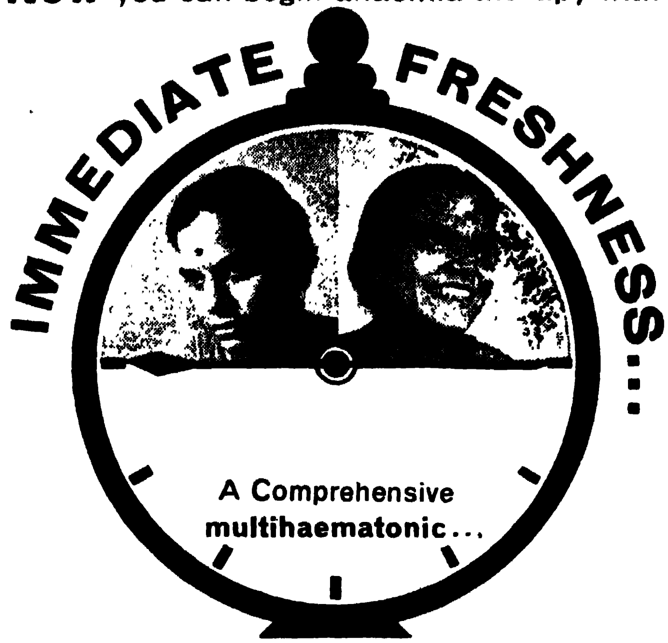
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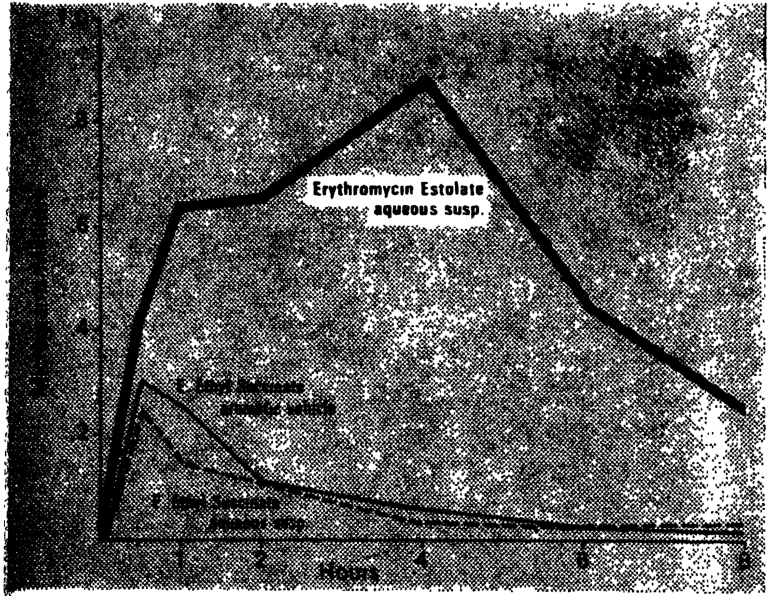

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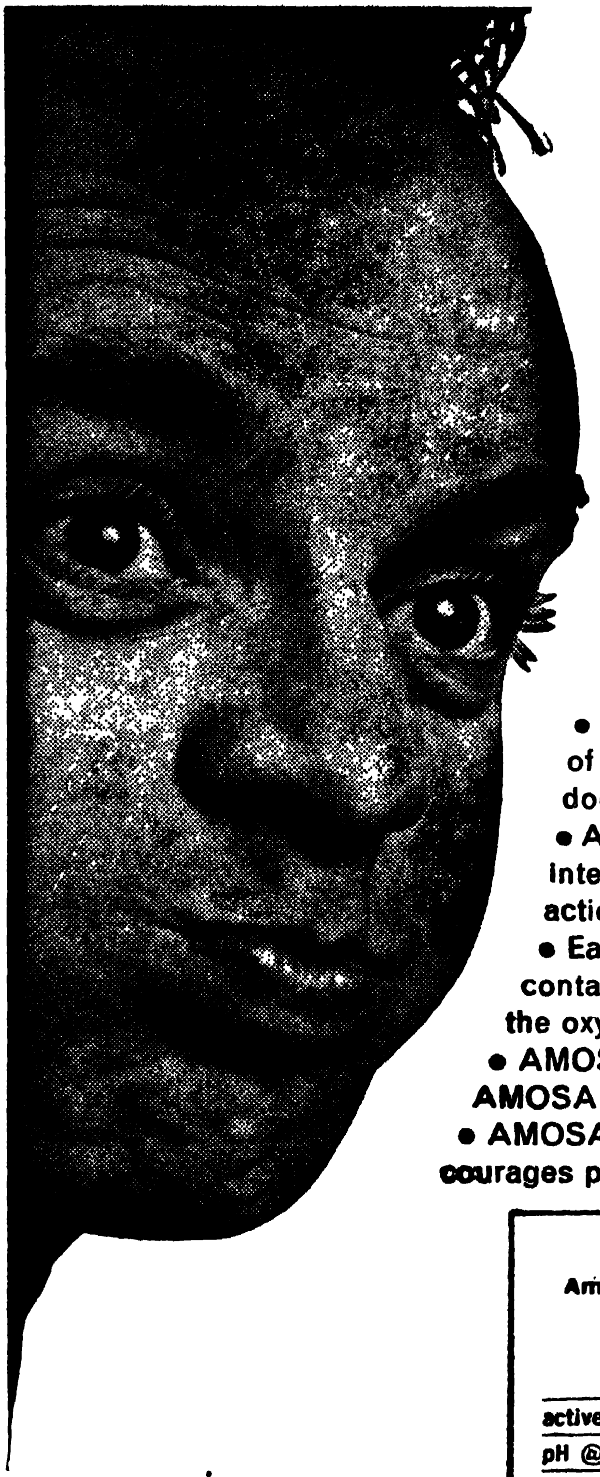

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References: 1. Wade, A.B.: The Dent. Practitioner 14:185 (Jan.) 1964. 2. Smith, J. F. et al: Dent. Survery 45:33 (Nov.) 1969. 3. Rise, E. et al: Arch. Otolaryng. 90:135 (Oct.) 1969.

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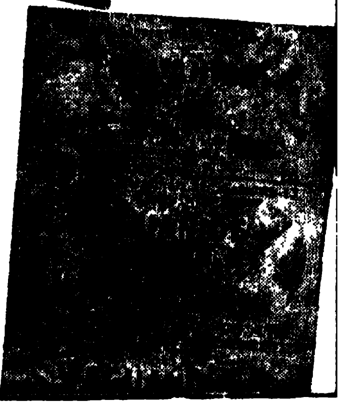

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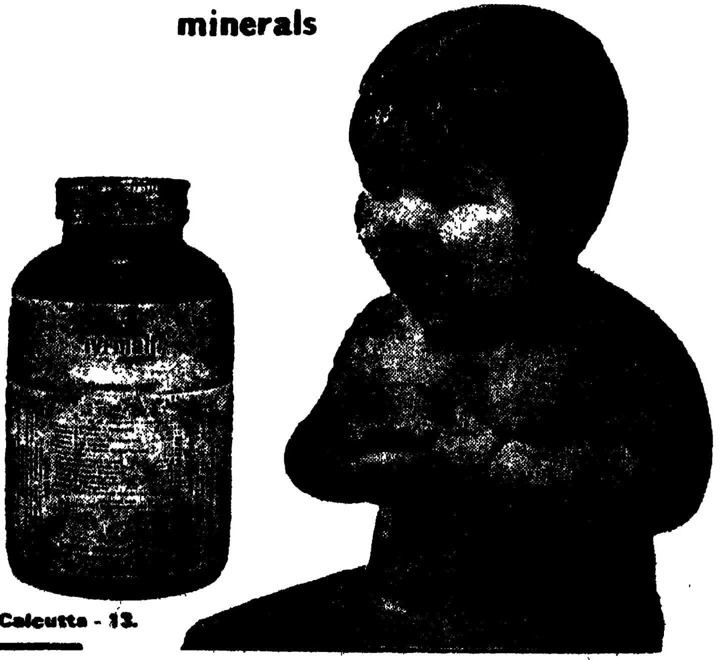

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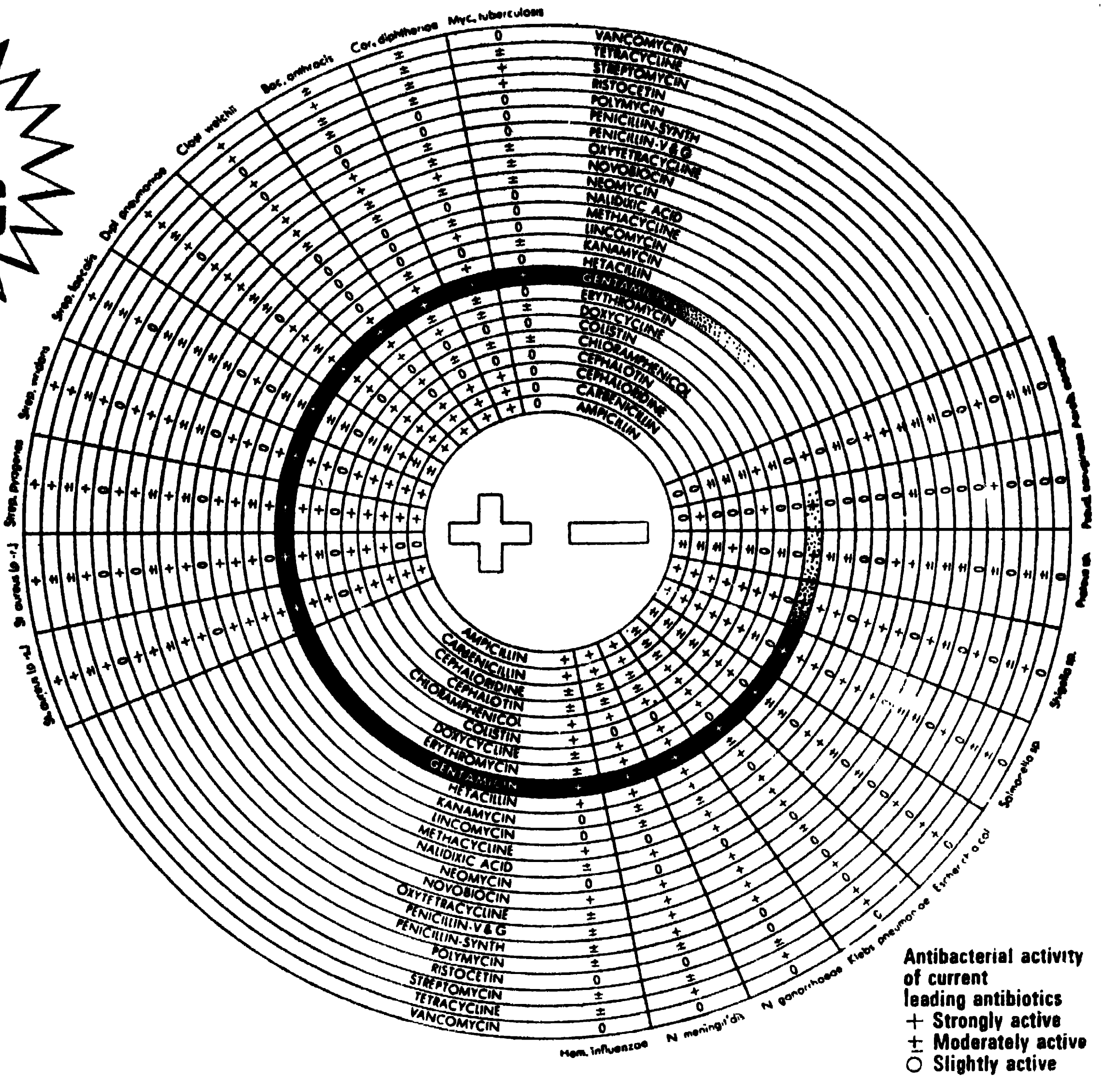

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ORIGINALS AND PAPERS

1

Psychiatric Unit in a General Hospital in India: Patterns of Inpatient Referrals

N. N. WIG*, D. K. SHAH**

[Received for publication January 13, 1971]

In India, till recently psychiatric unit in a general hospital was a rare phenomenon. Thanks to the enlightened medical leadership and community pressure, a number of such units has come up during the last decade in teaching hospitals all over the country. Due to extreme shortage of total beds in mental hospitals (less than 18 thousand for a population of 550 million), such general hospital psychiatric units are called upon to play a very significant role in the total mental health service programme of the country. The overall advantages and disadvantages of such psychiatric services has been extensively reviewed elsewhere both in the U.K. (McKeown, 1966; R.M.P.A. memorandum, 1967) and in the U.S.A. (Kaufman, 1965). A very important activity of such units is the consultation service it provides for inpatients in medical and surgical wards. The incidence and nature of such psychiatric inpatient referrals has varied in different reports depending on the background of different hospitals (Kenyon and Rutter, 1963; Bridges *et al.*, 1966; Crisp, 1968; Prabhakaran, 1968). The present study was undertaken with a view to find out the pattern of referrals and usefulness and limitations of such service in a teaching hospital in India.

MATERIAL AND METHOD

The present study includes 515 psychiatric referrals from various inpatient wards of the Nehru Hospital, a teaching hospital attached to the Postgraduate Institute of Medical Education and Research, Chandigarh, from January, 1964 to December, 1968. The bed complement comprises 21 psychiatric beds in a conventional ward within the hospital.

The usual routine for consultation on psychiatric inpatient referrals was as follows : within 24 hours of receiving consultation chit the referred cases were seen in the first instance by a senior Resident or Registrar. The records of detailed psychiatric work up by the Resident or Registrar was maintained on plain sheet of papers. Three times a week, on alternate days, the consultant psychiatrist discussed the new referred cases worked up by the junior staff. Subsequently frequent follow-up evaluation of these cases was done by the Registrar and the consultant. Appropriate psychological tests were administered whenever indicated. A separate record book was maintained which contained the name, age and sex of the patients, referring ward, admission diagnosis, reason for referral, psychiatric assessment and final disposal. Cases referred from paediatric wards were not included in the present study as these cases were referred to and managed in our child guidance clinic.

Collection of data—The data were obtained from the records mentioned above (case histories and

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** M.D., Registrar

record book). Total number of patients admitted in various referring wards and their sex distribution were made available from central registration department of the hospital for statistical evaluation.

RESULTS

TABLE 1—SHOWING INCIDENCE OF PSYCHIATRIC INPATIENT REFERRAL IN TOTAL ADMISSION

Period	Total No. of patients admitted	No. of cases referred	Percentage
January, 1964 to December, 1964	6769	81	1·19
January, 1965 to March, 1965*	1910	24	1·25
January, 1966 to December, 1966	10761	135	1·16
January, 1967 to December, 1967	11490	125	1·09
January, 1968 to December, 1968	13223	160	1·20
TOTAL	44153	515	1·17

* Data are not available for the period from April, 1965 to December, 1965.

TABLE 2—SHOWING SOURCES OF PSYCHIATRIC INPATIENT REFERRALS

Referring consultant	No. of cases referred	Percentage of total referrals
Physicians	379	73·6
Surgeons	106	20·6
Gynaecologists ...	30	5·8
TOTAL ...	515	100·00

TABLE 3—SHOWING DETAILS OF PSYCHIATRIC ASSESSMENT (DIAGNOSIS) OF REFERRED CASES

Psychiatric assessment (Group)	No. of cases	Percentage
1. Primarily a psychiatric illness (no organic pathology demonstrable)	159	30·9
2. Psychophysiological disorders	33	6·4
3. Psychiatric symptoms associated with organic brain pathology (OBS)	112	21·7
4. Psychological reaction to organic illness (functional overlay)	101	19·6
5. Co-existing psychiatric illness (independent of organic illness)	35	6·8
6. Non-psychiatric disorder (probably organic)	75	14·6
TOTAL	515	100·00

TABLE 4—SHOWING DIAGNOSTIC BREAK UP OF "PRIMARILY A PSYCHIATRIC" ILLNESS GROUP

Diagnostic categories	No. of cases	Total	Percentage
Neuroses:		93	58·5
Hysterical neurosis ...	51		
Anxiety neurosis ...	34		
Depressive neurosis ...	6		
Obsessive compulsive neurosis	1		
Phobic neurosis ...	1		
Psychoses (functional):		42	26·4
Manic depressive ...	5		
Involutional melancholia ...	5		
Psychotic depression NOS ...	8		
Schizophrenia ...	21		
Paranoid state ...	3		
Personality disorders:		18	11·4
Personality disorders ...	5		
Addiction	7		
Attempted suicide ...	6		
Mental deficiency with neurotic symptoms		6	3·7
TOTAL ...	159	159	100·00

TABLE 5—SHOWING REASONS FOR ADMISSION OF "PRIMARILY A PSYCHIATRIC" AND "NON-PSYCHIATRIC" DISORDERS GROUP

Reasons for admission (System involved)	Primarily (functional) psychiatry group (N=159) percentage	Non-psychiatry group (N=75) percentage
Gastro-intestinal system (pain abdomen, vague GIT symptoms, anorexia, constipation, vomiting, pain, etc.) ...	35·00	21·30
Cardiovascular system (palpitation, sinking, precordial pain, etc.)	7·00	4·0
Respiratory system (difficulty in breathing and chest pain, etc.)	3·80	5·3
Central nervous system (fits of unconsciousness, involuntary movements, sensory symptoms, paralysis, encephalitis, epilepsy, etc.)	18·00	50·7
Genito-urinary system (menstrual disorders, hyperemesis, pelvic inflammation, frequency of micturition, etc.) ...	13·00	8·0
General and miscellaneous (vague bodily symptoms, lack of energy, etc.)	23·20	10·7
TOTAL ...	100·00	100·00

TABLE 6—SHOWING DISPOSAL OF THE PSYCHIATRIC INPATIENTS REFERRALS

Mode of disposal		No. of cases	Percentage
Managed in respective wards	...	218	42·3
Transferred to psychiatric outpatient	...	186	36·1
Transferred to a psychiatric bed	...	36	7·0
No further psychiatric help given	...	75	14·6
TOTAL	...	515	100·00

DISCUSSION

The incidence of psychiatric inpatient referrals reported in the literature seems to vary considerably. Kaufman (*loc. cit.*) attributed this to difference in the level of sophistication of the medical general staff and availability of resource people such as psychiatric consultants in general hospitals. The incidence of 1·17 per cent of all admissions (1 in 85) recorded in the present work is comparable to 1·3 per cent reported by Shepherd *et al.* (1960) and 0·7 per cent by Fleminger and Mallett (1962) from the U.K. In India Prabhakaran (*loc. cit.*) and Parekh *et al.* (1968) have reported 1·4 per cent and 0·66 per cent incidence respectively. The incidence of inpatient referral reported from U.S.A. is higher as compared to above reports from England and India, Meyer and Mandelson (1960) and Eilenberg (1965) reported 8·8 per cent and 2·2 per cent incidence respectively from U.S.A.

Physicians referred the highest number of cases (73·6 per cent) followed by surgeons (20·6 per cent) and gynaecologists (5·8 per cent). These findings are in agreement with the findings reported in literature (Shepherd *et al.*, *loc. cit.*; Eilenberg, *loc. cit.*; Kenyon and Rutter, *loc. cit.*; Parekh *et al.*, *loc. cit.*). Higher number of referrals from physicians, in our opinion, seems to be due to the fact that patients suffering from psychiatric disorders with predominantly bodily symptoms are liable to get admitted more often to medical wards for investigation. Chronic organic illnesses with superadded psychological disorders are also more often encountered in medical wards. Moreover, it is likely that physicians have a broader psychosomatic approach compared to surgeons. Low referral rate from gynaecologists is rather puzzling, but might be due to the latter's acceptance of emotional disturbance in relation to menstruation, pregnancy, etc., as often normal.

The reasons for psychiatric referrals in general hospital differ in various set-ups. In the present study the management of gross psychiatric symptoms and the problem of diagnosis were the two main reasons for referral in the early years of our inpatient referral service. With increasing recognition of usefulness of psychiatric consultation, subsequently, minor psychological disturbances and even normal or borderline psychological reactions to organic illness were considered to be sufficient reasons for referral. Still later, we were occasionally called upon to deal with administrative probems involving patients and medical staff of the wards. Discharge of an unwanted patient from hospital, aggressive and uncooperative behaviour, patient making sexual advances towards nurses, or overcomplaining patient, were some of the reasons for which psychiatric opinion and advice were sought. Problem of diagnosis, i.e., organic *versus* functional nature of illness (53·4 per cent), and disturbed behaviour with a clear-cut organic illness (38·6 per cent) accounted for majority of cases. Referral for psychosomatic disorders (6·4 per cent) was rather low.

Primary psychiatric illness with no demonstrable organic pathology (functional psychiatric illness) in 30·9 per cent of inpatient referrals recorded in the present study is in agreement with fiindings reported in literature by others (Fleminger and Mallett, *loc. cit.*; Crisp, *loc. cit.*; Prabhakaran, *loc. cit.*). These cases usually presented with bodily symptoms and were admitted to medical and surgical wards for investigation. Failure to demonstrate organic pathology on investigation, resulted in calling psychiatrist for giving opinion about possibility of a functional nature of illness. These cases required a thorough psychiatric work up. The usual pointers, like family and past history of mental illness, premorbid personality and reactive environmental factors, were taken into account before giving a diagnosis of primary functional psychiatric illness. In these groups we recorded high incidence of hysterical neurosis (32 per cent), followed by anxiety neurosis (21 per cent), affective disorder (15 per cent) and schizophrenia (13 per cent).

Toxic and other types of confusional psychoses (organic brain syndrome) accounted for 21·7 per cent of the total inpatient referrals. Incidence of organic brain syndrome in inpatient referrals seem to be very high in India. Prabhakaran (*loc. cit.*) and Parekh *et al.* (*loc. cit.*) reported 38·9 per cent and 41·6 per cent incidence of organic brain syndrome respectively from India as compared to Fleminger and Mallett (*loc. cit.*) and Eilenberg (*loc. cit.*) who reported 5·9 per cent and 8·6 per cent incidence respectively from Western countries. This finding is difficult to explain. It might possibly reflect the bias of the referring physicians or an actual higher incidence of organic brain syndromes in Indian general hospitals, which might be a reflection of poor nutritional status or presence of infection, etc.

Psychological reaction to a chronic disabling or serious organic illness was recorded in 19·6 per cent of the cases. This group was given the label of "functional overlay". Anxiety, depressive and hysterical symptoms were the usual psychological reactions in these cases. Psychosomatic disorders accounted for only 6·4 per cent of the referrals. This finding is in agreement with findings reported in Indian literature (Parekh *et al.*, *loc. cit.*), but differs markedly from that reported in Western literature.

The present study differs in one significant finding from other studies. While in 85 per cent of our cases we were able to reach appropriate psychiatric diagnosis, in 15 per cent of cases we did not find sufficient psychiatric disturbance to warrant the label of a psychiatric illness. All these cases had physical symptoms but no significant physical signs and the referring chit often tersely read "Physically N.A.D. Referred to Psychiatry" with the provisional impression of hysteria or conversion reaction. We strongly felt that absence of physical signs was not enough justification to call a particular symptom psychogenic and we always resisted to offer a psychiatric diagnosis until evidence in the shape of personality or environmental factors was clearly demonstrable. It was satisfying to note that some of these cases on follow-up turned out to be organic illness like occult malignancy, unsuspected tuberculosis, amyloidosis, collagen diseases, etc. However we do feel that referring consultants were fully justified in having a psychiatric opinion at that stage before embarking on a lengthy and costly procedure of various laboratory investigations.

It is interesting to compare the presenting symptoms in the two groups, labelled primary psychiatric illness and non-psychiatric illness respectively (Table 5). Both groups were referred to us for unexplained bodily symptoms. While the gastrointestinal symptoms were commoner in the primary psychiatric group, the central nervous system symptoms were noted in over half the cases in the non-psychiatric group.

It has been recorded by many observers that incidence of hysteria is much higher in India and other underdeveloped countries as compared with Europe or America. We have used this label for nearly one-third of cases in the primary psychiatric illness group (51 out of 159). Perhaps there will be some additional cases in the functional overlay group also. This is in spite of the fact that an equally large group of 75 cases which was referred to us as probably hysteria, this diagnosis was not accepted by us and we termed them as non-psychiatric.

Management in respective referring ward (42·3 per cent) and transfer to psychiatric outpatient (36·1 per cent) seems to be two main modes of disposal. Only 7 per cent of the patient were transferred to a psychiatric bed (Table 6). There was no occasion to transfer a patient from the general ward to a distant mental hospital. No special problem arose in managing the patient in non-psychiatric wards, although much anxiety had to be relieved among the nursing staff in orientating them to psychiatric nursing.

SUMMARY

The records of 515 patients referred for psychiatric consultation from the inpatient wards of a teaching hospital in India over a period of 5 years, were analysed. Incidence of 1·17 per cent of all admissions compares well with that reported by other investigators in India and U.K. but is less than generally reported from U.S.A. The problems of differential diagnosis between an "organic" and "functional" illness and management of acute psychiatric disturbances constituted the bulk of the referrals. The incidence of organic brain syndromes and hysterical illness in the referred cases seemed higher as compared with other studies from Western countries. About 15 per cent of the referrals which were reported to be having "no organic illness" were not accepted as "psychiatric" due to insufficient evidence of psychological disturbance.

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2

Serum Sialic Acid in Different Bone Disorders

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Sialic acid (N-acetyl neuraminic acid) occurs in combination with proteins in human blood serum along with five other monosaccharides (galactose, mannose, glucosamine, galactosamine and fucose). In the last few years different workers all over the world have demonstrated that the concentration of glycoprotein in human serum is abnormally high in number of pathological states where the underlying pathology is either of tissue destruction, tissue proliferation, depolymerisation or inflammation. Raised values of sialic acid have been recorded in malignancy, tuberculosis, rheumatic fever and rheumatoid arthritis, etc. The present study was undertaken with a view to establish any significant relationship between the level of sialic acid present in the serum and the activity of the disease process and also to find out if its estimation can be of the use in diagnosis and prognosis of different bone disorders.

MATERIAL AND METHOD

In this study forty-three Indians formed the control group (21 males, 12 females and 10 children). The healthy adults were students, doctors and blood donors. The healthy children were selected from those attending the "well baby clinic" of L.L.R. Hospital, Kanpur. A careful enquiry regarding present and past history of illness combined with thorough clinical check-up, was performed to exclude diseases in them.

50 blood samples of different bone disorders (19 osteoarticular tuberculosis, 8 chronic osteomyelitis, 5 pyogenic arthritis, 12 malignant bone tumours, and 6 rheumatoid arthritis) were obtained from the subjects attending the outdoors and from the patients admitted to orthopaedic indoors of L.L.R. Hospital, Kanpur.

Nineteen cases of osteoarticular tuberculosis, diagnosed on history and clinical findings, were subjected to radiography and blood examination mainly for ESR. Every efforts were made to find out any primary focus. The cases were placed in two groups. The first group included those patients who had acute symptoms, cold abscesses and signs of paraparesis or paraplegia in cases of Pott's spine. These patients had received no specific antituberculosis therapy. The second group included those patients who did not have acute symptoms, cold abscesses, or neurological findings and had taken antituberculosis therapy but irregularly. The disease was still active.

Out of 13 cases of pyogenic infection of bones and joints diagnosed clinically and confirmed by x-ray, pus culture and blood examination, 8 were of chronic osteomyelitis of long bones and 5 were of acute pyogenic arthritis and patients in both the groups had received antibiotics.

In six cases of rheumatoid arthritis the clinical diagnosis was confirmed by x-ray and blood examination. ESR was elevated and Rose-Waaler test was positive in all the cases. Each patient had taken salicylates for a period of three to four months prior to their visit to orthopaedic outpatient department.

Our series also included twelve cases of malignant bone tumours. In each case the diagnosis was confirmed by histopathological examination, out of which eleven were primary and one secondary from thyroid. Primary malignant bone tumours comprised osteogenic sarcoma (4), osteoclastoma (3), chondrosarcoma (2), adamantinoma of jaw (1) and one case of multiple myeloma.

Estimation of sialic acid:—Samples consisted of at least 3 c.c. of blood and were collected in dry sterilised vials. After 2-3 hours sera were separated, centrifuged for 10 minutes and again put into dry sterilised vials. Sera thus obtained were stored at 7°C in a refrigerator. All estimations were undertaken within 24 to 36 hours of obtaining the samples

Sialic acid in serum was estimated by the method described by Winzler using crystalline N-acetyl neuraminic acid (K & K Lab. U.S.A.) for standardisaiton. All other chemicals used in the preparation of reagents were of analytical grade of guaranteed purity. Optical densities were read on unicam spectrophotometer S.P. 500.

RESULTS

Serum sialic acid estimation was carried out in healthy adults and children of varying age groups (Table 1). The values of sialic acid in mg. per 100 ml. of serum, of healthy adults and children are shown in Table 2. It will be seen from the data presented that sialic acid values are similar in adult males and females but slightly higher than those in children.

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TABLE 1—SHOWING THE AGE INCIDENCE OF CONTROL GROUP

Age in years	No. of cases
3—7	3
8—10	6
11—15	1
16—20	5
21—25	4
26—30	18
31—32	6
Total	43

TABLE 2—SHOWING THE MEAN VALUES OF SIALIC ACID IN THE SERA OF NORMAL ADULTS AND CHILDREN

Serum	No of cases	Sialic acid mg./100 ml mean ± S E *
Adult males	21	76·1 ± 1·3
Adult females	12	74·0 ± 2·1
Total	33	75·3 ± 1·1
Children	10	69·4 ± 1·9

* Values are mean with standard error (S.E.)

The values of serum sialic acid in different bone disorders are shown in Table 3. It can be observed that values are much above normal level in tuberculous and pyogenic infection of the bones and joints, rheumatoid arthritis and malignant bone tumours.

TABLE 3—SHOWING THE MEAN VALUES OF SIALIC ACID IN DIFFERENT BONE DISORDERS

	No of cases	Sialic acid mg./100 ml. mean ± S E *
Osteoarticular tuberculosis:	19	113·6 ± 3·6
Group I	8	120·5 ± 6·6
Group II	11	108·5 ± 2·6
Chronic osteomyelitis:	5	107·2
Acute pyogenic arthritis:	8	98·4
Total	13	103·8 ± 3·9
Malignant bone tumours.	12	124·8 ± 6·7
(i) Osteogenic sarcoma	4	120·5 ± 6·8
(ii) Osteoclastoma	3	147·7 ± 9·8
(iii) Chondrosarcoma	2	115·0
(iv) Adamantinoma	1	112·0
(v) Multiple myeloma	1	80·0
(vi) Secondaries	1	150·0
Rheumatoid arthritis:	6	101·0 ± 7·3

* Values are mean with standard error (S.E.).

DISCUSSION

The value of serum sialic acid has been very well studied (Winzler, 1955; Bettelheim-Jevons, 1958; Carter and Martin, 1962; Sharma and Sur, 1967; Gupta *et al.*, 1969). The values reported by authors outside India range between 60-65 mg./100 ml. and the values reported by workers in our country range from 75-86 mg./100 ml. The values observed by us in adult males 76·1 mg./100 ml., adult females 74·00 mg./100 ml. and in children 69·4 mg./100 ml. are in close proximity to those authors (Sharma and Sur, *loc. cit.*; Singh and Rama Rajoo, 1967), who have also worked in the same laboratory. The values in adults were slightly higher than children but no significant difference was recorded between the values in males and females. These observations were much similar to the findings of Singh and Rama Rajoo (*loc. cit.*). Serum sialic acid was estimated in 19 cases of osteoarticular tuberculosis, as mentioned above. The cases were placed in two groups. The mean value was 113·6 mg./100 ml. which is much higher than the normal value. On further analysis of the values in both the groups, we found that in the first group the values were 120·5 mg./100 ml. and in second group 108·5 mg./100 ml. This means that the values goes on increasing with the activity of the disease. This elevated level can be attributed to the process of inflammation and tissue destruction. Investigators like Winzler (*loc. cit.*) and Sharma and Sur (*loc. cit.*) have reported the values to be 178 mg./100 ml. and 115 mg./100 ml. respectively.

Workers like Coburn *et al.* (1953, 1954) have reported an increase in serum concentration of sialic acid in the pyogenic infection of bones and joints. We also observed that serum sialic acid value in case of chronic osteomyelitis of long bones i.e. 107·2 mg./100 ml. was more than the normal value. In cases of acute pyogenic arthritis the value observed by us was 98·4 mg./100 ml. Our two cases were running high temperature, at the time of obtaining blood sample, in both the cases the values were slightly more than the other cases. Shetlar and his collaborators in 1953 have also shown experimentally that the carbohydrate associated with seromucoid fraction is elevated in fever produced by infection of pyromen and by agents producing inflammatory reaction. This increase in serum concentration is accountable not only to severe inflammatory process but to bone destruction and new bone formation as well.

In six cases of rheumatoid arthritis the mean value of 101 mg./100 ml. was also higher than the normal level of serum sialic acid. Carter and Martin (*loc. cit.*) have reported a mean value of 122 mg./100 ml. Coburn *et al.* (1953) have also reported high value in this disease state.

Different workers have reported considerably raised values of sialic acid in the serum in malignancy in general (Seibert *et al.*, 1948 ; Cohen *et al.*, 1950 ; Reigel *et al.*, 1950 ; Rajoo and Sur, 1966). But their study did not deal with the malignant bone tumours exclusively. In our series of twelve malignant bone tumours four cases of osteogenic sarcoma had an average value of 120 mg./100 ml., 3 cases of osteoclastoma grade 3 had mean value of 147·7 mg./100 ml., 2 cases of chondrosarcoma had mean value of 115 mg./100 ml. The only case of adamantinoma of the jaw revealed value as high as 112 mg./100 ml., and in a solitary case of multiple myeloma we got the value of 80 mg./100 ml. which was near normal value. One case of secondaries from thyroid with pathological fracture in femur we obtained value as high as 150 mg./100 ml. On an average the mean value of malignant bone tumours was found to be 124·8 mg./100 ml. This value is very high when compared to other disorders with high sialic acid contents in the serum.

The elevation above normal level of serum sialic acid reflects many processes as put forward by different workers from time to time. Seibert *et al* (*loc. cit.*) observed an increase in alpha$_2$ globulin in tissue destruction. Shetlar *et al.* (1949) were of the opinion that the underlying pathology of tissue proliferation is reflected in the form of raised serum glycoproteins. It has been proposed that the increase concentration of serum glycoprotein may be a result of the depolymerisation of the ground substance of connective tissues with the release of solubolised components into the circulation (Catchpole, 1950). In support of this view Catchpole (*loc. cit.*) had shown that connective tissue adjacent to transplanted tumour in mice contained more material with the solubility properties and chemical composition of seromucoid than did the connective tissue remote from tumour. Similarly, Engel in 1952 found that with the dissolution of bone following administration of parathyroid hormone to rats there was a pronounced increase in the serum seromucoid levels.

The significant rise in tuberculous and pyogenic infection of the bones and joints, malignancy and rheumatoid arthritis can be explained on the basis of any of the processes like tissue destruction, inflammation, and depolymerisation of the ground substance of the connective tissue.

The present study does not indicate that the estimation of serum sialic acid can be used for the diagnosis of particular disease affecting the bones and joints, as elevated sialic acid level is observed in all those diseases where the underlying pathology is of tissue destruction, tissue proliferation, depolymerisation or inflammation. But since the level is known to vary according to the severity of the disease, the test can act as an index of prognosis. The value of estimation of sialic acid as against ESR examination in these disorders where it is within normal range, needs further investigation. In view of the time consuming and sensitive methodology used in estimation of sialic acid, as against the easy and convenient method of estimation of ESR, this test is unlikely to find its applicability in clinical practice.

SUMMARY

Serum sialic acid level in healthy Indian children and adults have been reported. The values are independent of sex, but higher in adults. The study in different bone disorders like osteoarticular tuberculosis, rheumatoid arthritis and malignant bone tumours have been undertaken. Values are considerably higher in all these pathological states.

ACKNOWLEDGMENT

We wish to thank Indian Council of Medical Research, New Delhi, for generous award of the fellowship to undertake this study.

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3

The Use of the Mousseau-Barbin Tube (Locally Manufactured) for Palliation in the Carcinoma of the Oesophagus and Cardia

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Primary carcinoma of the oesophagus or of the cardiac end of the stomach continues to present the surgeon with difficult problems in treatment. It is generally agreed that resection offers the best treatment for neoplasms of the oesophagus and cardia, the mortality remaining as high as 24·6 per cent for primary resection (Ogilvie, 1960).

When radical surgery is planned but the growth is found to be irremovable, a by-pass operation may be feasible (Allison and Borrie, 1949 ; Allison and Tavaers D Silva, 1953). Miller (1962) found that the mortality for by-pass operation was 55 per cent and palliation of symptoms was often unsatisfactory. Mullard (1960) was also dissatisfied with the result of palliative surgery. Intubation of the inoperable growth is preferable to a by-pass operation as our patients are malnourished, come late when carcinoma is far more advanced. It carries a lower mortality.

In the past intubation was accomplished by insertion after endoscopic dilatation of the malignant stricture, by passing a coiled Souttar's tube or its plastic counterpart. The lumen of the tube was narrow and patients diet was almost entirely restricted to fluids. One of the main disadvantages of the tube is that it often gradually works its way through the stricture and passes down into the stomach.

In view of these and other difficulties Mousseau *et al.* (1956) devised a new type of tube made from neoplax, a flexible but incompressible plastic tube consisting of funnel shaped upper end, an intermediate tube and a long flexible guide which can be passed through the stricture (Fig. 1). Since total ban of import, tube similar to the one described, locally manufactured at Agra by Ramson Plastic, available in three sizes (medium, small and large) was used in the present study of 22 cases. Modification of the Mousseau-Barbin tube have been made by Celerstion (1959) and Greening and Ramsay (1960).

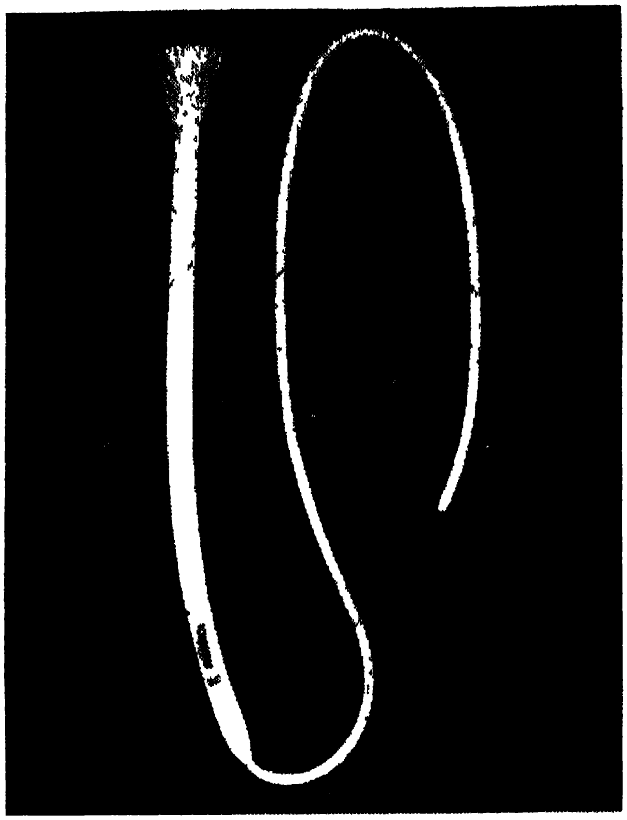

FIG 1

OPERATIVE TECHNIQUE

When the intubation is performed as a palliative measure, a gastrostomy is made through a small laparotomy. Before laparotomy, it is necessary to pass an oesophagoscope and to thread a gum elastic bougie through the growth into the stomach. There is some difficulty in doing this especially if the neoplasm is at the cardia and the lumen of the stricture cannot be identified. In such circumstances it is usually possible to pass the bougie upwards from the stomach, guiding it into the oesophagus by a finger inserted into the stomach. Care must be taken to avoid perforating the wall at the awkard cardio-oesophageal angle (Fig. 2).

One end of the bougie is now in the stomach, the other end in the mouth and the oesophagoscope must now be removed. The fine end of the Mousseau-Barbin tube is attached to the upper end of the bougie by a stitch taking into account the distensibility of the lumen of the stricture, as large a tube as possible is chosen for insertion. It seems

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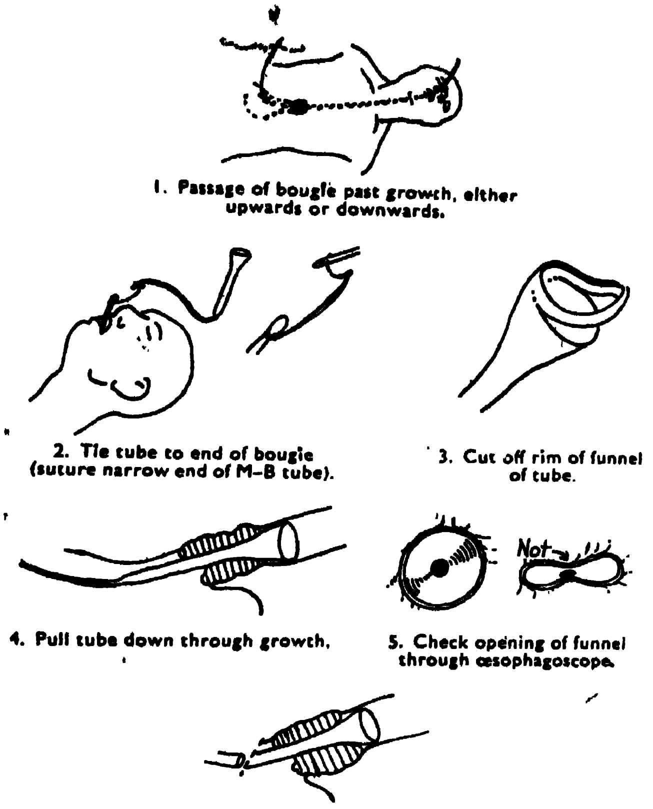

1. Passage of bougie past growth, either upwards or downwards.

2. Tie tube to end of bougie (suture narrow end of M-B tube).

3. Cut off rim of funnel of tube.

4. Pull tube down through growth.

5. Check opening of funnel through oesophagoscope.

6. Cut off end of tube below growth.

Insertion of Mousseau-Barbin tube.

FIG. 2—SHOWING STEPS OF INSERTION OF MOUSSEAU-BARBIN TUBE

to us that the funnel end of the tube, as manufactured, is too large for safety in most instances, we trim the upper end with scissors about 1-1·5 cm. from the edge. The tube is then pulled down into the oesophagus by the abdominal operator and the progress of the upper end is watched by the oesophagoscopist. This is easily done if the back of the oesophagoscope is put into the funnel and gentle pressure exerted with the instrument during the downward passage of the tube. The tube is pulled down until the funnel begins to be impacted in the strictured area. When the tube is satisfactorily in position the abdominal operator cuts off the lower end of the tube below the neoplasm. Judgement must be exercised to choose a level which is not too long and which should not be so short as to become occluded by extension of the growth.

The carcinoma arising from the oesophagus may be found to be inoperable at thoracotomy (with the intention to resect it). It is usually better to retrieve the tip of the bougie through a small longitudinal incision in the oesophagus below the neoplasm, this will avoid having to insert an unnecessary length of the tube. The stomach wall, of course, has to be utilised if the growth is at the lower end of the oesophagus and may be exposed through an incision in the diaphraghm. It is in fact often preferable to passing the bougie upwards from below the tumour in order to avoid the awkwardness of passing an oesophagoscope with a patient in the lateral position on the operating table. Passing the oesophagoscope down with its tip in the funnel presents no difficulty in this position.

As an alternative, it is sometime possible to insert a suitably prepared Mousseau-Barbin tube without a laparotomy. It is also less disturbing to the patient. A bougie passed through the constricted area at oesophagoscopy is used as guide over which the Mousseau-Barbin tube can be introduced after removal of the oesophagoscope. It is necessary to cut the Mousseau-Barbin tube to suitable dimension for the particular case and to manipulate it with the finger until the funnel has passed the cricopharyngeus muscle. The oesophagoscope is then passed again and the remainder of the tube, i.e., the journey is accomplished by pushing it with the beak of the instrument. It carries few dangers, i.e., the tube may be pushed too far. If funnel is not made small enough, any attempt to remove the tube may result in laceration of the mucous membrane of the oesophagus. Also any sharp edge left on the lower end of the tube may cause perforation of the oesophagus later on.

Both these operative procedures can be done either under general anaesthesia or local anaesthesia depending on the condition of the patient.

RESULTS

The Mousseau-Barbin tube has been used to palliate dysphagia in 22 patients. All of them had a primary carcinoma of the oesophagus. In 2 cases the carcinoma was involving the upper ⅓ of the oesophagus, in 8 cases the middle ⅓ and in 12 cases it was involving the lower ⅓ of the oesophagus.

The age range in the series was from 56 years to 70 years, with average age at 60 years All our patients survived intubation operation.

In only two cases intubation was done following thoractomy as the growth was found inoperable. In one case of cancer involving the middle third and in the second case involving the upper third intubation was done by the oesophagoscope without gastrostomy. It is our opinion that the gastric method of insertion is the method of choice and a thoracotomy is not justifiable unless there is a good prospect of being able to do radical operation. We had no operative mortality from this procedure. In 10 cases local anaesthesia was used as the patients were considered poor risk for general anaesthesia.

In six cases wound infection occurred, a remarkably low figure, when one considers that it is virtually impossible to maintain a sterile field during this method of intubation.

Out of 22 cases 20 cases were of squamous variety and 2 cases were adenocarcinoma. In 16 cases the carcinoma was in males and in 6 cases in females. All cases were given a course of palliative radiation after surgery. First 20 cases received deep x-ray therapy while the last 2 cases received cobalt therapy and mitomycin. As this drug is fairly expensive most of our poor patients cannot afford this. The large sized tube was used in 16 cases and medium sized tube in six cases only. Sixteen cases died and survival time was between 5-11 months with an average of 6 months.

Impression of the clinical results are of necessity subjective, but in our experience the relief of dysphagia has, on the whole, been satisfactory. Most of our patient could swallow liquid and semisolid diet. All patients were advised to drink clear water or coca cola after every meal which prevented tube blockage with food debris.

DISCUSSION

When Mousseau and his colleagues (*loc. cit.*) introduced this new method of intubation they expressed the hope that it would provide satisfactory palliation with low mortality. Moghissi (1960) echoed a similar hope. Our experience in 22 cases is similar to these authors. Waddington and Bickford (1962) reported considerable mortality following this procedure and they attributed this to be due to inherent unsatisfactory state of patients than to the actual operative procedure.

In the present series the average survival was six months which was higher than the reported series by Smithers (1957), Watson and Goodner (1957), Mullard (*loc. cit.*) and Macarther and Mercer (1969) where the survival was shorter than the average of three months.

In selected cases disadvantage of this method are few. The main disadvantage is the result of pressure of either the upper end or the lower end of the tube on the wall of the oesophagus or stomach. If the rim of the funnel is too large it may cause necrosis of the oesophageal wall with subsequent mediastinitis or even necrosis of the arch of the aorta. The last complication with fatal haemorrhage in 2 patients has been described by Jamieson *et al.* (1960). Fortunately, neither of these two complications did occur in the present series.

If too large a tube is inserted, it may split the stricture during intubation and pressure of a large tube on the oesophagus may result in retrosternal pain. Such pain may also be due to gastric reffux if the tube passes through the cardia and requires antacid to relieve it.

One should not be too optimistic about the restoration of normal swallowing after intubation and the patient shuld be cautioned not to eat coarse or bulky food items which cannot readily be masticated. Stringy fruits and vegetables or those with skins or fibrinous pulp should be avoided but with discrimination a reasonable variety of soft foods may be ingested and an appreciable degree of pleasure of eating may be restored to the patient during the short period of life that remains to him. All meals should be taken with liberal amount of drinks and an effervescent drink taken daily is very useful in keeping the lumen of the tube clear. Endoscopic clearence of impacted particle is nevertheless occasionally necessary.

SUMMARY

Experience with 22 cases of malignant obstruction of the oesophagus treated by the Mousseau-Barbin tube, locally manufactured is described.

The technique of intubation is described and the advantage and disadvantage of the method are discussed.

It is concluded that this method of palliative intubation gives satisfactory results when used with discretion.

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4

Repletion Studies on Liver Proteins and Liver Enzymes by Feeding Some Wild Leguminous Seed Protein Isolates

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Faced with protein malnutrition caused by acute food shortage when some of the profusely growing indigenous wild leguminous seeds of Acacia and Albizzia species were subjected to chemical screening (Yadav and Bharadwaj, 1971) for their exploration, they were shown to be good sources of proteins, suggesting the possibility of their inclusion in animal nutrition for maintaining growth and normal health. However, the whole seed meal proved to be unpalatable as well as toxic in some cases due to the presence of undesirable wild seed constituents and so it was thought useful to employ their isolated proteins instead.

Since adequate health is dependent on nutritional condition of animals and the changes in nutritional state are paralleled by significant alterations in liver proteins (Addis *et al.*, 1936 a, b) and enzyme activities (Kosterlitz, 1947; Miller, 1948 and 1950; Litwak *et al.*, 1953; Van Pilsum *et al.*, 1957; Muramatsu and Ashida, 1961; Williams, 1961) in liver tissue, the present study was carried out to investigate the efficiency of the protein isolates under examination with respect to their effects on normal health conditions and capacity to replete the total liver protein, catalase, acid and alkaline phosphatase, proteolytic and succinic dehydrogenase activity.

MATERIAL AND METHOD

Normal male albino rats, weighing 110 to 160 g., were used for the experiment. The liver protein repletion method of Harrison and Long (1945) was employed for the determination of liver repletion capacity of the experimental seed protein isolates by standardising the animals for one week on a diet containing casein (20 per cent W/W). They were then divided into nine groups each consisting of six rats. At the end of one week, one group of six rats was sacrificed and the total liver portein, acid and alkaline phosphatase, catalase, proteolytic and succinic dehydrogenase activity were determined. The remaining eight groups of rats were fasted for 48 hours and a group of six rats was sacrificed at the end of the fasting period and the liver was analysed for the total protein and the enzyme activities mentioned above. Diets containing protein isolates of the experimental seeds, unsupplemented and supplemented with the deficient essential amino acid (Yadav, 1970) *l*-tryptophan (0·20 per cent W/W) and *l*-methionine (0·15 per cent W/W) and casein diet were fed to the remaining seven groups of experimental animals for four days. At the end of the experimental period the animals were sacriticed and the liver was assayed for total protein, acid and alkaline phosphatase, catalase, proteolytic and succinic dehydrogenase activity.

Assay procedures—Rats were sacrificed by a hard blow on the head, livers were dissected out immediately, pressed in a fold of filter paper to wipe off the blood and rapidly weighed. They were then homogenised with a known volume of ice-cold water (glass distilled) in an all glass homogeniser with acid washed sand, both precooled in ice. The homogenate was filtered through double layered muslin cloth and used for the estimations.

For the estimation of total liver protein, biuret method ot Kingslay was followed as described by Hawk *et al.* (1954a). The activities of the acid and alkaline phosphatase were determned with appropriate blanks of buffered β-glycerophosphate substrate of Bodansky (1933). For the estimation of alkaline phosphatase activity, the incubation procedure of Bodansky with suitable modification enabling one to employ Sumner's method (1944) using ferrous sulphate as reducing agent to determine the liberated phosphate, was adopted. For acid phosphatase activity determination, the method of Shinowara *et al.* (1942) as described by Hawk *et al.* (1954a, b) was followed. Proteolytic activity was assayed by the method of Matsushita and Iwami (1967) and catalase activity was estimated by employing the procedure as described by Hawk *et al.* (1954a, b). The colorimetric method of Murthy and Swaminathan (1955) was followed for the estimation of succinic dehydrogenase activity.

RESULTS AND DISCUSSION

The efficiency of the different protein isolates of wild leguminous seeds with respect to their capacity to replete liver proteins, during casein diet feeding at 20 per cent protein level for one week, was shown to be 20·06 ± 3·36 per cent of total liver protein content (Table 1). This declined to 15·05 ± 3·99 after fasting the animals for 48 hours. The increased liver protein level (18·8 ± 2·91) after the casein diet at 20 per cent level depicts that the

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TABLE 1—SHOWING REPLETION STUDIES ON LIVER PROTEINS AND LIVER ENZYMES BY FEEDING SOME WILD LEGUMINOUS SEED PROTEIN ISOLATES

(Values expressed mean of six male rats ± standard deviation)

Diet	Body weight (g.)	Liver weight (g.)	Percentage of total protein in the liver	Alkaline phosphatase activity (units/mg. wet liver)	Acid phosphatase activity (units/mg. wet liver)	Catalase activity (units/g. wet liver protein)	Proteolytic activity (units/mg. wet liver)	Succinic dehydrogenase activity (units/mg. wet liver)
Initial (control)	139·8 ±25·3	4·13±0·62	20·06±3·36	3·24±1·5	6·21±2·46	16·65±7·32	1·20±0·61	2930·6±37·61
Fasted group	157·1 ±23·5	4·45±0·76	15·05±3·99	6·10±3·59	2·86±1·35	23·28±3·72	3·82±2·32	1240·7±16·32
Casein	159·3 ±27·6	5·09±0·86	18·81±2·91	4·01±1·68	5·65±0·84	17·27±4·71	1·18+0·66	2560·3±26·25
A	148·6 ±18·8	4·31±0·59	16·24±2·34	5·40±3·75	2·91±0·83	19·92±2·25	3·65±1·21	1505·1±13·23
B	156·69±20·6	5·03±0·76	17·86±3·56	4·62±2·32	4·87±0·65	18·11±1·63	1·46±0·82	2430·7±86·12
C	154·67±25·5	4·49±0·67	15·12±2·52	5·65±2·72	2·88±0·16	20·76±1·06	3·59±1·35	1480·3±18·27
D	157·48±30·7	4·63±0·63	17·04±3·38	4·91+1·62	3·49±1·36	19·01±1·78	1·87±0·96	2005·1±13·17
E	158·34±21·5	4·91±0·79	14·98+3·49	5·97±2·62	2·98±0·32	21·32+2·62	3·70±1·34	1499·2±28·27
F	147·46±23·6	4·62±0·68	16·92±3·12	4·82±1·92	3·85±0·86	18·72±1·96	1·67±0·83	2234·6±15·38

animals almost replenished the liver protein deficiency during the 4 days of experimental period.

Casein diet: Consisted of the following ingredients; Soluble starch—60 parts, casein—20 parts, sugar—10 parts, ground nut oil—6 parts, salt mixture* —2 parts, vitamin mixture† —2 parts.

Experimental protein diets prepared in the same proportions as the casein diet except that the casein was replaced in different diets by the respective seed protein isolates:

A: *Acacia arabica* protein diet (unsupplemented), B: *Acacia arabica* protein diet (supplemented with *l*-tryptophan and *l*-methionine), C: *Acacia catechu* protein diet (unsupplemented), D: *Acacia catechu* protein diet (supplemented with *l*-tryptophan and *l*-methionine), E: *Albizzia moluccana* protein diet (unsupplemented), F: *Albizzia moluccana* protein diet (supplemented with *l*-tryptophan and *l*-methionine).

When the fasted animals were fed on unsupplemented isolated protein diets of *Acacia arabica, Acacia catechu* and *Albizzia moluccana* seeds, the total liver protein contents were found to decline further to 16·24±2·34, 15·12±2·52 and 14·98±3.49 per cent respectively, thus revealing the nutritional inadequacy of these protein isolates. However, on supplementing them with limiting amino acids *l*-methionine and *l*-tryptophan under the same experimental conditions, the liver protein levels were shown to be raised by 1·62, 1·92 and 1·94 per cent respectively, indicating that the essential amino acid supplementation of the proteins improved that condition of animals by a fast repletion rate in depleted liver tissue during the experimental period.

It is also evident from the results that during the starvation period, alkaline phosphatase and catalase activities were shown to be appreciably increased, indicating an enhanced level of metabolic reactions in the liver tissues. When these animals were fed on casein diet, normal levels were recovered. However, supplemented protein isolates have also shown these enzymic levels approaching to normal values whereas unsupplemented diets have revealed a tendency to increase the liver enzyme levels due to the enhanced metabolic reactions during the experimental period.

The decline in acid phosphatase activity during starvation, reflects the depletion of liver proteins, since resumption of casein diet once again enhanceed the activity of this enzyme with a corresponding simultaneous increase in liver protein. The deciline in acid phosphatase on the other hand, in the fasted albino rats on administering the unsupplemented test proteins emphasised their essential amino acid deficiency and an imbalance in the amino acid make-up. However, the supplementation thereof resulted in the restoration of the enzymic activity.

The enhanced level of proteolytic activity during starvation signifies an enhanced level of metabolic reactions in the liver tissue. However, normal level was achieved on repleting the liver protein with casein and essential amino acid supplemented experimental protein isolates, while the unsupplemented diets showed a tendency to increase the proteolytic activity during the experimental period.

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* Salt mixture was prepared according to Hawk *et al.* (1954b)

† Vitamin mixture was made as follows:
Vitamin A (200,000 units/g.) 9·0 per cent; vitamin D (400,000 units/g.) 0·5 per cent; tocopherol 10·0 per cent; vitamin C 9·0 per cent; menadione 4·45 per cent; niacin 9·0 per cent; biotin 0·04 per cent; folic acid, 0·18 per cent; riboflavin 2·0 per cent; pyridoxine hydrochloride 2·0 per cent; thiamine 2·0 per cent and calcium pantothenate 6·0 per cent.

Results have also shown that there is a significant loss of succinic dehydrogenase activity during 48 hours starvation of experimental animals but on keeping the animals on casein diet for the next four days they repleted the enzyme protein promptly. The unsupplemented diets, on the other hand, failed to enhance any activity but the enzymic level was further reduced in liver tissues on consumption of these diets, indicating that during these feeding conditions there may be a metabolic block in the production of optimum quantity of apo-enzyme due to the unbalanced amino acid make-up of the test proteins. However, supplementation with methionine and tryptophan in these proteins recorded an enhanced level of the enzyme activity approaching the normal value of standard casein diet.

SUMMARY

While studying the nutritional characteristics of wild leguminous seeds of *Acacia arabica, Acacia catechu* and *Albizzia moluccana* species, it was thought to be of interest to investigate them with respect to some of their important effects on the body systems from a medical standpoint. Accordingly, the present study was made to investigate the effect of *Acacia arabica, Acacia catechu* and *Albizzia moluccana* seed protein isolates on total liver protein, acid and alkaline phosphatase, catalase, proteolytic and succinic dehydrogenase activity in normal young albino rats which revealed them to be inadequate for the maintenance of normal health conditions. However, supplementation with essential amino acid methionine and tryptophan improved the conditions of experimental animals depicting the fast repletion rate in depleted liver tissue in restoring the enzyme levels to normal.

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5

Glycerine Solutions for Measurement of Blood Specific Gravity in Paediatric Cholera

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The degree of dehydration of a cholera patient when first seen is usually judged clinically. This is open to subjective variations. Determination of plasma specific gravity by the copper sulphate method (Phillips *et al.*, 1950) would provide an objective guide, but this cannot usually be done in the field for non-availability of a centrifuge and difficulty of collecting adequate amount of blood from paediatric cases. Besides, copper sulphate of desirable quality is not readily available. Hence, glycerine method was tried in a small series of cholera patient using finger blood, as was popularised by Rogers, but it did not appear to us satisfactory. This was mainly because of the difficulty in measuring with reasonable accuracy the volumes of pure glycerine, which is highly viscous, while

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** M Sc., D.Phil., Department of Biophysics preparing the different standards of aqueous soultions. To avoid this, a final gravimetric estimation of the specific gravity of the solution was considered necessary.

MATERIAL AND METHOD

Preparation of glycerine solutions—Preparation of aqueous glycerine solutions of different specific gravities was made using the relation:

$$K = x_1 \ (k_1 - k_2)/100 + k_2 \ . \ . \ . \ . \ . \ (1)$$

where K, k_1 and k_2 are the specific gravities of the final solution, pure glycerine and water respectively and x_1 is the volume of glycerine to make 100 ml. of the final aqueous solution. Assuming k_1 as 1·26 and k_2 1·0, the volumes of glycerine (x_1) needed to make 100 ml. of aqueous solutions of known specific gravities were calculated and presented in Table 1.

TABLE 1—SHOWING PREPARATION OF GLYCERINE SOLUTIONS OF DIFFERENT SPECIFIC GRAVITIES ASSUMING THE SPECIFIC GRAVITY OF PURE GLYCERINE AS 1·26 AND THE DENSITY OF WATER AS 1·0 G./ML.

Sp. Gr.	Vol. of glycerine to make 100 ml. aqueous solution (ml.)	Sp. Gr.	Vol. of glycerine to make 100 ml. aqueous solution (ml.)
1·030	11·50	1·052	20·05
1·032	12·30	1·054	20·80
1·034	13·10	1·056	21·55
1·036	14·05	1·058	22·30
1·038	14·80	1·060	[illegible]
1·040	15·30	1·062	24·00
1·042	16·30	1·064	24·80
1·044	17·05	1·066	25·55
1·046	17·80	1·068	26·30
1·048	18·55	1·070	27·05
1·050	19·30		

In a central laboratory, this table can be used as a rough guide in the preparation of standard solutions. A small amount of copper sulphate (1 mg./ml.) is added to these solutions to prevent microbial growth during preservation for a longer period. The correct specific gravities of these solutions are then measured gravimetrically with the help of a specific gravity bottle. The standard solutions so prepared may then be supplied in corked bottles and used for field work.

Measurement of specific gravity—Blood (enough to form 3 to 4 drops) is taken from the finger in a capillary pipette or haemoglobin pipette carefully avoiding air bubbles. The tip of the pipette is held 1 cm. above the surface of a standard glycerine solution kept in a bottle and then a drop is extruded. To start with a bottle containing glycerine solution of specific gravity on the higher side (say, 1·064) is tried. If the drop of blood first sinks a little, remains stationary for a few seconds and finally sinks to the bottom, the specific gravity of the glycerine solution in the particular bottle is read as that of the blood. If, on the other hand, the drop of blood immediately sinks down or floats to the surface, the glycerine solution of higher or lower specific gravity is tried. If it rises in one and falls in the next, the specific gravity is taken as between these two. With a little bit of experience, the correct specific gravity can usually be determined with only 3 to 4 trials.

RESULTS AND DISCUSSION

Normals—For normal values of blood specific gravity, samples of blood from 29 selected children aged up to 5 years and attending the Skin Outdoor of the School of Tropical Medicine, but not suffering from diarrhoea, anaemia or oedema were collected and estimations were made by the glycerine method. The measured specific gravity values ranged between 1·044 and 1·053, the mean being 1·050 and standard deviation ±0·004.

Paediatric cholera—Finger blood was taken from 55 patients aged up to 5 years with different degrees of dehydration and the specific gravity on admission was measured by the glycerine method. The measured values were found to range between 1·054 and 1·070 with a mean of 1·063 and standard deviation ±0·005.

In a number of cases, the specific gravity of blood was measured simultaneously by the copper sulphate method and the present glycerine method. Good agreement in values (difference not exceeding ±0·001) obtained by the two methods was noted.

It appears that glycerine method is reliable and can be used with advantage in rural areas to measure blood specific gravity and ascertain more precisely the degree of dehydration when the patient, especially a paediatric case, is first seen. The degree of dehydration of patients may be graded as + + +, + + and + in terms of blood specific gravities above 1·064, between 1·060 and 1·064 and below 1·060 respectively. This method may also be used to check overhydration during intravenous therapy. Studies on a larger series of cases are in progress.

SUMMARY

The preparation and use of aqueous solutions of glycerine in the measurement of specific gravity of finger-tip blood in paediatric cholera have been described and the results discussed. The method appears reliable and is feasible even in remote areas.

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PRACTITIONERS' SERIES

Paralytic Poliomyelitis Following Inoculation with Combined Diphtheria-Tetanus-Pertussis Prophylactic

A Review of Sixteen Cases with Special Reference to Immunisation Schedules in Infancy

S. N. BASU*

Paralytic poliomyelitis is still a major crippling disorder of children in India (Basu, 1968). Studies in different parts of our country have revealed that it is a widely prevalent and endemic disease with occasional outbreaks (Gharpure, 1954, 1963; Basu, 1962, 1966a, 1966b; Reddi, 1962; Paul *et al.*, 1964; Singh *et al.*, 1964). In the recent past, attention has been drawn to the factors which might precipitate, predispose to or aggravate paralysis in poliomyelitis. Physical activity, trauma including fractures, intramuscular injections, operations have all been incriminated. Inoculations with prophylactic agents have been particularly blamed. The present paper deals with sixteen cases of paralytic poliomyelitis following intramuscular inoculations with combined diphtheria, tetanus and pertusis prophylactic within the preceding month of the illness.

MATERIAL AND METHOD

The study has been undertaken at the B. C. Roy Polio-Clinic and Hospital for Crippled Children, Calcutta. The diagnosis was based on history, physical findings and follow-up study. A history of preparalytic illness as fever, stiffness of neck and back, etc., followed by paralysis of lower motor neurone type, patchy affection, asymmetrical involvement in case of two limbs, absence of features of objective sensory impairment, non-progressive course and a variable recovery were considered essential criteria. Muscle power assessment was done in all the cases according to the method advocated by the Medical Research Council (1943). Cerebrospinal fluid studies were done only in two cases. No virological investigation could be carried out due to lack of facilities.

Details of inoculation with diphtheria, tetanus and pertussis prophylactic were recorded as per statement of parents/guardians and confirmed by notes from past hospital tickets or practising physicians.

OBSERVATIONS

A brief summary of the cases is furnished in Table 1. It would be seen that there were 7 patients between the ages of 6 months and 1 year (43·75 per cent) and 13 patients under 3 years of age (81·25 per cent). The youngest patient was aged 6 months and oldest 6 years. There were 11 males and 5 females. The duration of the illness on the first day of attendance varied between 6 days and 3 months. The sites of inoculation were arms in 6 cases (left arm in 5 and right arm in 1 case), and buttocks or thighs in 10 cases. The paralysis followed first dose of intramuscular inoculation with combined diphtheria, tetanus and pertussis prophylactic in 9 cases, 2nd dose in 4 and 3rd dose in 3 cases. Out of the 16 cases reviewed, 15 developed paralysis of the limb inoculated with or without involvement of other parts. One patient (case 7. S.D.) who received the inoculation in the right buttock, developed paralysis of the right upper limb. The interval between the inoculation and onset of the illness was between 1 and 10 days in 8 cases, 11 and 20 days in 5 cases, and 21 and 30 days in 3 cases—the shortest being 3 days and longest 30 days. In cases with involvement of two limbs, it was seen that the inoculated limb was more severely affected than the non-inoculated limb. In cases with affection of upper limbs, the deltoid and other muscles of the shoulder were paralysed in all, followed in order of frequency by the elbow flexors and extensors. The distal group of muscles were comparatively spared in upper limbs.

In case 10 (S.C.), cerebrospinal fluid study on the 22nd day of illness revealed 10 cells/c.mm. (all lymphocytes) and protein 45 mg. per cent. In case 15 (J.D.) cerebrospinal fluid on the 11th day of illness revealed 15 cells/c.mm. (all lymphocytes) and protein 80 mg. per cent.

DISCUSSION

Martin (1950) reported 17 poliomyelitis cases who developed paralysis of a single limb within four weeks of receiving an injection. Of them 15 cases followed immunisation and 2 cases followed

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TABLE 1—SHOWING BRIEF SUMMARY OF THE CASES

Cases	Age	Sex	Duration of illness on the day of 1st attendance	Dose of prophylactic inoculation	Site of inoculation	Distribution of paralysis	Interval between inoculation and onset of illness (in days)
1. GM	2 years 3 months	M	3 months	2nd	Rt. arm	*RUL	4
2. BM	6 months	M	15 days	1st	Rt. thigh	RUL	4
3. BR	8 months	M	6 days	2nd	Lt. thigh	LLL & abd. muscles	14
4. CM	9 months	M	29 days	1st	Rt. thigh	BLL Rt. > Lt.	12
5. BP	6 years	F	30 days	1st	Lt. thigh	BLL & abd. muscles	30
6. BS	8 months	M	30 days	1st	Lt. buttock	LLL & abd. muscles	3
7. SD	8 months	F	10 days	2nd	Rt. buttock	RUL	24
8. KM	10 months	M	25 days	3rd	Lt. thigh	LLL	4
9. BD	2 years 10 months	M	11 days	1st	Lt. thigh	LLL	8
10. SC	1 year 6 months	M	10 days	1st	Lt. arm	LUL. LLL	6
11. JH	4 years 9 months	M	3 months	1st	Lt. arm	LUL. RLL	10
12. DC	10 months	M	2 months	1st	Lt. thigh	BLL Lt. > Rt.	15
13. MK	2 years	F	9 days	3rd	Lt. arm	LUL	28
14. SP	2 years 3 months	M	16 days	3rd	Lt. arm	LUL	13
15. JD	3 years 6 months	F	7 days	2nd	Lt. arm	LUL	13
16. SM	1 year 3 months	F	12 days	1st	Lt. thigh	LLL	8

* RUL—Right upper limb. LUL—Left upper limb. RLL—Right lower limb. LLL—Left lower limb. Abd.—Abdominal. BLL—Both lower limbs.

penicillin injections. Martin (*loc. cit.*) therefore suggested consideration of suspending immunisations during outbreak of poliomyelitis. Banks and Beale (1950) investigated 111 poliomyelitis patients admitted to one London Hospital during the years 1947, 1948 and 1949 and could find 14 cases developing paralysis following immunising injections. The paralysis followed combined pertussis and diphtheria (APT) prophylactic in nine cases and pertussis vaccine alone in one case and diphtheria prophylactic alone in 4 cases. Hill and Knowelden (1950) in a statistical investigation also found that the recently inoculated limb was much more frequently affected than was the case with children not recently inoculated. The paralysis was observed to follow both inoculation with APT and combined APT and pertussis vaccines. McLeod (1951) using PTAP could not find any association between site of inoculation and site of paralysis during an epidemic of poliomyelitis. In order to diminish the risk of postinoculation poliomyelitis, Bousfield (1951) suggested subcutaneous route instead of intramuscular route for immunisations. Geffen *et al.* (1953) reported 29 children who developed paralytic poliomyelitis after a recent inoculation. In over 80 per cent of his cases, the interval between inoculation and onset of poliomyelitis was between 5 and 6 days. Grant (1953) also concluded that there was no doubt about the increased risk to a child of developing paralytic poliomyelitis as a result of intramuscular injections at a time when poliomyelitis is prevalent. Lieben (1953) could obtain history of immunising injections in 24 cases out of 411 poliomyelitis patients within 90 days prior to the onset of illness. Townsend-Coles and Findlay (1953) reported 7 cases of paralysis resembling poliomyelitis following injections of quinine and one following penicillin Truetta and Hodes (1954) from their experimental evidence pointed out that spinal puncture and the injection of various substances are the most damaging influences. Basu (1963) in a study at Calcutta in 1961 could elicit the history of injections in the preceding month in 38 patients out of 252 acute paralytic poliomyelitis patients. But in none of them, a history of inoculation with a prophylactic agent could be elicited.

In the present series, the youngest patient was aged 6 months and oldest 6 years. The age distri-

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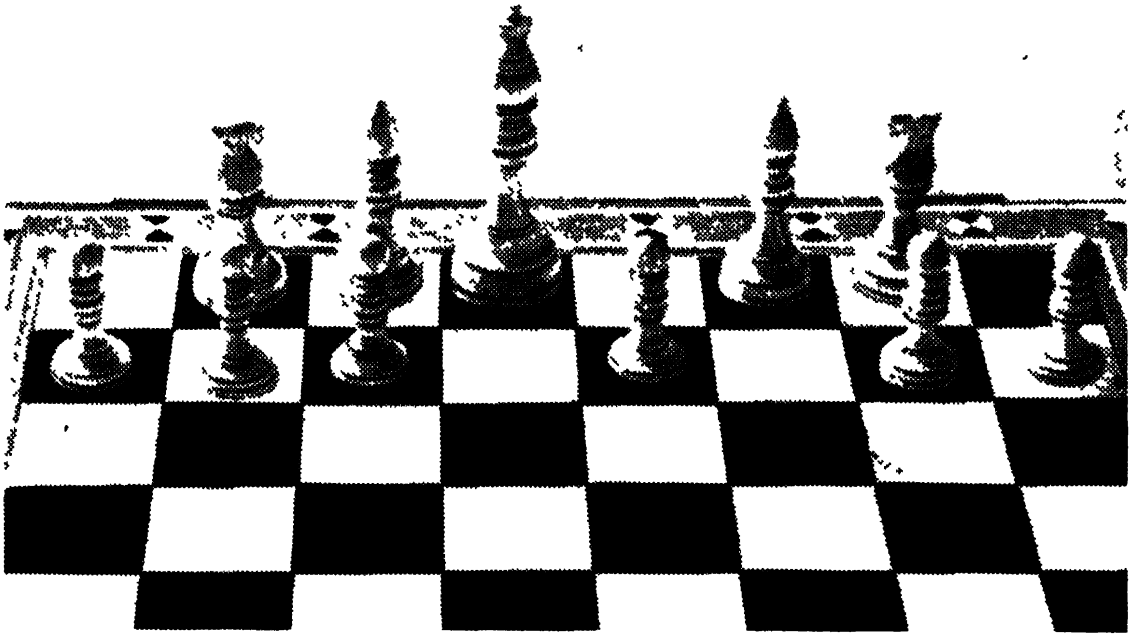

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bution of the disease has been studied previously (Basu, 1963, 1966a, 1966b). The incidence of the disease under 3 months of age has been found to be very low. From 6 months onwards, the disease shows a rapid upward trend to reach the peak incidence between 1 and under 2 years of age. On this basis Basu *et al.* (1972) in a recent communication suggested oral polio vaccination to commence between 4 to 6 weeks of life and three doses at an interval of 4 to 8 weeks. This procedure will thus avoid the risk of developing paralytic poliomyelitis following inoculation with combined diphtheria, tetanus and pertussis prophylactic.

The actual incidence of post-inoculation poliomyelitis is not known. A good follow-up study of all children receiving prophylactic inoculations may reveal the actual facts.

Paralytic poliomyelitis developing after inoculations might cause an unnecessary embarrasment to a practising physician. Postinoculation poliomyelitis appears to be an avoidable complication and should therefore be avoided.

There are three factors which need be taken into consideration (i) Children in the age group susceptible to poliomyelitis getting, (ii) inoculation with a prophylactic agent in presence of, (iii) polio virus. The inoculation only acts as the trigger mechanism in localising or precipitating the paralysis. Thus the problem is not seen in countries where polio vaccine has been extensively used and poliomyelitis has ceased to be a problem. In countries like ours where poliomyelitis is still an important problm, inoculation with combined diphtheria, tetanus and pertussis prophylactic may occasionally be followed by paralytic poliomyelitis unless protected by polio vaccine. So in children in the age group susceptible to poliomyelitis inoculation with combined diphtheria, tetanus and pertussis prophylactic should be preceded by polio vaccine. Alternatively combined diphtheria, tetanus and pertussis prophylactic and oral polio vaccine may be started at a very young age (say, prior to 3 months of age) when children are not so susceptible to poliomyelitis as suggested by the American Academy of Pediatrics (Evanston, 1969).

SUMMARY AND CONCLUSIONS

Sixteen patients who developed paralytic poliomyelitis following inoculation with combined diphtheria, tetanus and pertussis prophylactic have been reported. Relevant literature has been reviewed. In order to avoid postinoculation paralytic poliomyelitis it is suggested that polio vaccination should precede inoculation with combined diphtheria, tetanus and pertussis prophylactic in children in the age group susceptible to poliomyelitis.

ACKNOWLEDGMENT

The author is grateful to his colleagues, Drs. S. K. Banerjee, B. K. Basu, K. C. Chowdhury, J. N. Banerjee and D. P. Banerjee for their co-operation and help.

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1

Transitional Cell Carcinoma of Anal Canal

AMAR CHAUDHURY*

Dukes (1946) has described the anorectal region as a "fertile soil for pathological curiosities". At least eight varieties of carcinoma occur in this region. They include: (1) Adenocarcinoma of the anal canal arising *de novo* or spreading from the lower part of the rectum, (2) squamous carcinoma originating in the lower part of the anal canal or spreading upwards from the perianal skin or occurring in scar tissues of the lower rectum, (3) colloid carcinoma arising from perianal fistulae, (4) adenocarcinoma arising from the intermuscular perianal glands, (5) muco-epidermoid carcinoma originating from the ducts of these glands, (6) melanoma, (7) carcinoid tumour and (8) transitional cell carcinoma. Among the less familiar tumours occurring in this region is that form of carcinoma which arises from the transitional epithelium of the anal canal. Although not rare, this tumour receives only brief mention in most modern textbooks of surgery and pathology. It is the purpose of the paper to report the main clinicopathological features of the disease, based on the study of seven cases.

CASE REPORTS

CASE 1:

J. H., male, 81 years, complained of pain in the back passage with bleeding P.R. and sciatic pain for one month.

On examination he was found to be fit for his age.

Rectal examination revealed an irregular hard ulcer anteriorly at the anorectal junction invading the prostate.

Treatment—Abdominoperineal resection of rectum was carried out. The mesenteric lymph nodes were involved i.e., Duke's "C" type. Liver was found to be free from secondaries. The patient died of coronary thrombosis on the 10th postoperative day.

Histology showed transitional cell carcinoma with extension to the regional lymph nodes (Fig. 1).

Autopsy—Autopsy confirmed the cause of death. No secondary growth was seen in the liver.

CASE 2:

H.S., male, 74 years of age, complained of bleeding per rectum for 6 months. On examination the general condition was poor, examination per rectum revealed a hard indurated mass at the 5 O'clock position, 1" from the anal verge.

Treatment — Left inguinal colostomy was performed. Unfortunately the patient died of peritonitis before the proposed perineal resection as a second stage procedure.

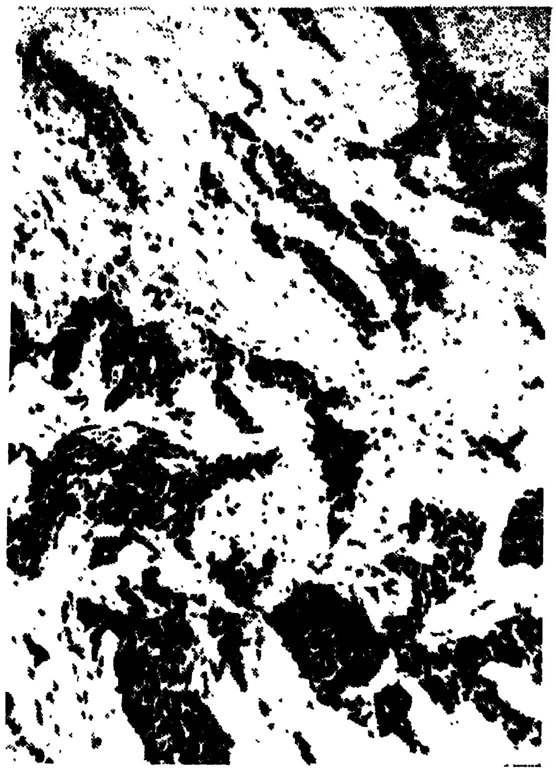

FIG. 1

Autopsy—Histology was of transitional cell carcinoma of the anal canal (Fig. 2). Para-aortic lymph nodes were involved, i.e., Duke's type "C". There was no secondaries in the liver.

CASE 3:

L. W., female, 72 years, complained of bleeding per rectum for 2 years, rectal pain for 3 months and lump in the left groin for 1 month. Examination revealed a hard, rounded and indurated mass at the anorectal region. There was a solitary hard node in left groin, not fixed.

Treatment—Abdominoperineal resection of the rectum was carried out with block dissection of left groin. There was no secondaries in the liver. Mesenteric lymph nodes were involved i.e., Duke's type "C".

Histology — Histology showed transtitional cell carcinoma invading the rectal mucosa and muscles. Mesenteric and inguinal lymph nodes were involved with the growth.

Progress—The patient died after one year, no postmortem was done.

CASE 4:

L. P., male, aged 62 years, complained of painful fissure-in-ano and rectal bleeding for two years. Rectal examination revealed the posterior anal fissure which was so painful that general anaesthesia was necessary to examine an indurated ulcer, 1 cm. from the anal verge.

Treatment—Biopsy of the fissure was followed by abdominoperineal resection of the rectum. No secondaries were felt in the liver.

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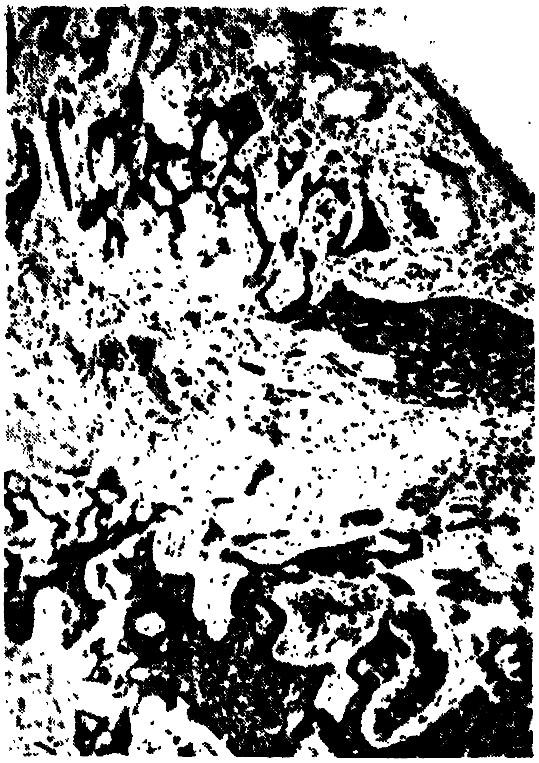

FIG. 2

Histology — Histology showed transitional cell carcinoma invading the rectal mucosa and muscles and also the perianal epidermis. Mesenteric lymph nodes were not involved i.e., Duke's type "B".

Follow-up — The patient was well and free from secondaries for over 5 years.

CASE 5:

L. A., male, 62 years, complained of bleeding P.R. and anal pain for 2 years.

Examination revealed the indurated fissure-in-ano. It was so painful that examination under anaesthesia was required to demonstrate the lesion which was a small indurated ulcer on the posterior wall of the anal canal. A biopsy was taken which was proved to be transitional cell carcinoma invading the muscles.

Treatment—Abdominoperineal resection of rectum was carried out. Mesenteric lymph nodes were not involved and no secondaries in the liver were detected.

Histology — Confirmed Duke's type "B" transitional cell carcinoma.

Follow-up — The patient has been well for over 8 years.

CASE 6:

H. S., male, 74 years, complained of bleeding P.R. and pain in the anal region for 6 months. On examination, an indurated mass in the posterior wall of the anal canal was found.

Treatment—Exploration was followed by left inguinal proximal colostomy. Regional lymph nodes were not involved. No secondaries were detected in the liver.

After the operation the patient died from peritonitis.

Autopsy—Autopsy showed infiltrating transitional cell carcinoma of the anal canal. Regional lymph nodes were involved i.e., Duke's "C" type.

There was no secondaries in the liver.

CASE 7:

L. D., male, 34 years, complained of feeling the ulcer himself, as he was apprehensive because both his parents died of cancer of the rectum. He was actually symptom-free.

Examination showed a small ulcer, 3/4" in diameter, just above the mucocutaneous junction.

Treatment—Abdominoperineal resection of the rectum was carried out. Regional lymph nodes were not involved. Liver was free from secondaries.

Histology — Histology showed transitional cell carcinoma of the anal canal. Mesenteric lymph nodes were not affected i.e., Duke's type "A".

Follow-up—Patient has been well for over 5 years.

DISCUSSION

A review of seven cases of transitional cell carcinoma of the anal canal is done with a view to indicate their clinicopathological characteristics. All cases in this series presented with bleeding per rectum and pain on defaecation except the youngest one (Case 7), who felt the ulcer himself. A hard lump in the groin was a prominent feature in one case. Two cases presented with fissure-in-ano, which was so painful that proper rectal examination could not be done without general anaesthesia. It felt exactly like chronic fissure but carcinoma was suspected as it had a rather hard and indurated feel. The importance of a proper rectal examination and biopsy of all suspicious fissures cannot be overstressed. In fact, a hard fissure-in-ano should be taken as carcinoma until proved otherwise. These tumours, as observed by Klotz *et al.* (1967), account for 2·7 per cent of anorectal neoplasms, occur twice as often in women and are most prevalent between ages 60 and 70.

The lesions are usually ulcerative or proliferative, primarily confined to the pectinate line. Under the microscope, the tumour is seen to be highly cellular and infiltrative. The cells are uniformly small and dark staining and there is a tendency to infiltrate in strands and islets in dense fibrous stroma. None of the cases in the present series had demonstrable seconderies in the liver at the time of operation. Pathologically, they are transitional cell carcinoma with potentialities of local invasion (seen in six out of seven cases i.e., Duke's type "B"), and regional lymph mode involvement (seen in four out of seven cases i.e., Duke's type "C"). Blood borne metastasis is rare as evidenced by the absence of liver secondaries.

In certain respects, the lesions resemble histologically basal-cell carcinoma of the skin (rodent ulcer), a resemblance which is heightened by a tendency for the cells to pallisade at the periphery of the processes. This similarity to basal-cell carcinoma has led to variety of descriptive names including basaloid small cell carcinoma (Wittoesch *et al.*, 1957), undifferentiated and non-keratinising squamous cell carcinoma (Morson, 1960). The occurrence of true basal-cell carcinoma of anal skin is an additional source of confusion and in this connection it is important to draw a distinction between basaloid carcinoma of the anal canal and basal-cell carcinoma of the anal skin as the former carries a graver prognosis in view of its tendency to metastasise.

We prefer the term "transitional cloacogenic carcinoma" introduced by Grinvalsky and Helwig (1956), on histogenetic and behavioural grounds, actually arising from the transitional zone of the epithelium in the anal canal.

In a recent clinicopathological study of 373 cases Klotz *et al.* (*loc. cit.*) supported the terminology on the same grounds. Their findings are similiar to ours, based on seven cases in 1960 in this series. They maintained that the usual histologic pattern resembled transitional neoplasm of the urinary bladder with pallisading at the periphery in the well-differentiated lesions. The most common variation was the addition of varying degrees of squamoid or epidermoid differentiation. Less common variants were muco-epidermoid and adenoid cystic patterns and a highly malignant oat cell type. Lymph node metastases were present in 33 per cent of patients at the time of operation. Perineal, rectal and posterior vaginal recurrences were noted in 25 per cent Metastases occurred in 19 per cent.

In management, abdominoperineal excision of the rectum remains the ideal treatment in operable cases (operability rate of 89 per cent). In general, the mortality rate is in the region of 10 per cent. Local excision which is favoured in the treatment of perianal carcinomata cannot be considered as effective treatment of these lesions. The local recurrences should be managed by surgical excision because the usual tumour has a decided propensity for slow growth and cures can be accomplished. Radiotherapy has not proved of much value and has fallen in disfavour due to the high rate of failure and post-radiation reactions. Postoperative radiation therapy does not seem to affect the survival figures. No uniformity of opinion exists about block dissection of inguinal nodes as elective procedure. This operation carries some mortality and significant morbidity when done in association with radical excision of the rectum. It can only be said that the incidence of secondary inguinal lymph node involvement of 33 per cent demands serious consideration in suitable cases. Stearns' (1955) figures suggest that some patients in whom clinical evidence of inguinal metastases develop after treatment of the primary lesion may be salvaged by resection of groin lymph nodes.

Prognosis is slightly better, when compared with the crude five-year survival rate of adenocarcinoma of the rectum. In this series the crude five-year survival rate of 44 per cent is comparable with the figure of 42·6 per cent, reported from St. Marks Hospital (Morson, *loc. cit.*). According to Klotz *et al.* (*loc. cit.*), the overall cure rate, exclusive of 31 postoperative deaths (8·4 per cent) and 5 inadequate follow-ups (1·3 per cent), was 46.7 per cent. The average survival time was 19·7 months without and 27·8 months with some form of treatment.

ACKNOWLEDGMENT

I am indebted to Dr. G. B. Forbes, the then consultant Pathologist to the Kent and Canterbury group of Hospitals, for his kind help and guidance and also his careful histological study of all the resected specimens. I am thankful to the surgeons, Mr. R. L. Canney, Mr. B. C. A. Liillwall and Mr. M. R. Williams, for their kind permission to quote from their cases.

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2

A Case of Carbon Monoxide Poisoning

P. N. BISWAS*, S. K. DUTTA**

Carbon monoxide (CO) poisoning is usually an acute condition. The patient either dies or recovers completely. In severe poisoning some delayed complications are seen. These complications are usually neurological and have been described as anoxic encephalopathy. Post CO poisoning cases may show neurological signs like parkinsonism, basal ganglion lesion or disorientation of psychological functions which may be delayed or immediate (*Brit. Med. J.*, 1970). The signs of involvment of frontal lobe, parietal lobe, occipital lobe, hippocampus have been also described. These cerebral involvements are rare and very few cases have been described in living conditions. This is a case of involvement of higher neurological functions along with signs of basal ganglion lesion, and signs of cerebral involvement with prolonged unconsciousness.

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Case Report

A. K. S., 26 years, male, came to us in an unconscious condition on 24-12-1970. History which was available from his neighbour, that the patient used to stay alone. Night, prior to this accident he took his dinner and went for sleep ; he also took the burning oven inside and closed the doors and windows. Next morning people heard a snoring sound from inside the room, and on call he could not be aroused from sleep. Ultimately they broke the door open and took him out in an unconscious state. He was attended by the local doctor, kept in the open air, given some 0_2 inhalation for about an hour and then brought to Central Hospital, Kalla, Asansol, for further treatment.

On examination, patient was completely unconscious and was not responding to pain stimuli. Skin was normal, pulse-126/minute, respiration-46/minute, temperature-99°F. B.P.—110/70 mm. of Hg. Pupils were slightly dilated. Tremor like movement was present all over the body. Tone was greatly increased all over the body. Both upper limbs were in attitude of flexion and both lower limbs were extended. All joints of the lower limbs were extended. Plantar bilaterally extensor. Neck-soft; heart and lungs were normal.

Investigations--Haemoglobin—13 g. per cent. Total WBC count—12,000/c.mm. with polymorphs—74 per cent, lymphocytes—21 per cent, eosinophils—5 per cent. Blood urea—28·6 mg. per cent. CSF—cell count less than 5/ c.mm., protein 35 mg. per cent, chloride 720 mg. per cent. Leucocytes showed marked toxic granules. Fundus was normal with pinkish red colour.

Bedside test for carbon monoxide was done and found postitive (haemoglobin solution produced by diluting blood—1:20 with distilled water, will turn brown upon addition of equal volume of 40 per cent sodium hydroxide whereas carboxyhaemoglobin solution remains red). Quantitative test for degree of saturation of blood with CO was not performed.

Management — On admission in the hospital, the patient was given O_2 inhalation at the rate of 4 litres per minute. The patient was kept under cover of antibiotics to prevent respiratory infection. Three bottles of fresh blood (250 ml. each) was given. Care of respiratory passage was taken to prevent any obstruction of the respiratory tract. Fluid and electrolyte balance was maintained by putting an intragastric tube and maintaining proper intake and output chart. The patient was nursed in the line of management of an unconscious patient, so long as he remained unconscious.

A week after the admission the patient was given physiotherapy mainly massage and passive movement of the joints daily till discharged.

Follow-up—The patient remained unconscious for 23 days, started opening eyes with a vacant look after 23 days and answering simple questions in about another 7 days' time. Complete mutism with gross sucking reflex was present during this period. The patient started responding to questions and simple answer after about two weeks time from previous state. Memory was dull throughout the period. Orientation of time and space was also depressed throughout whole period. Higher mental functions were clear in about 60 days time, but memory was still depressed.

Comments

CO poisoning depends on the percentage of gas in the inspired air, which is inversely proportional to the time of exposure. Usually the patient loses consciousness at about 50 per cent saturation of blood. Unfortunately the degree of saturation of CO in the patient's blood could not be ascertained due to technical difficulties.

This case illustrates some unusual features of CO poisoning, although cases have been reported with comatose condition, which may last for several days and weeks, but permanent brain damage, dementia, aphasia, apraxia, mutism are uncommon. Relatively common neurological manifestations are choreo-athetoid movement, parkinsonism and signs of different types of basal ganglion lesion. Confusional state may last as long as two months also described (Brain, 1969). The neurological manifetations are less emphasised in common textbooks. Ample evidence of anoxic brain damage namely focal or laminar necrosis of second and third cortical layers and often superficial white matters and degeneration of Purkinji cells, cerebellum has been shown in fatal cases, and a few such cases have been reported with features of neurological complications in living state (*Lancet*, 1968). Garland and Pearce (1967) showed neurological manifestations of CO poisoning in their cases—features like seizure, cortical blindness, dysphagia, aphasia, various agnosia, mental changes ranging from retardation to frank psychotic behaviour. Gorden (1965) reported a case of CO encephalopathy where the victim has neuropsychiatric complication after a latent period of 21 days. In between this period he was normal psychologically.

Interesting feature in this case is that the patient remained in a comatose state for 23 days. The patient became conscious and started opening eyes with vacant look after three weeks. Complete mutism lasted for another seven days. In addition, the patient developed gross sucking reflex indicating gross brain damage, particularly of frontal lobe. Rigidity was present all over the body. Confusional state persisted for about 30 days and the patient started responding to questions after 40 days' time. It took sixty days' time to regain the orientation of time and space although memory remained depressed. Besides these changes in higher neurological functions, signs of basal ganglion lesion like rigidity still persisted, even after two months of accident.

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CALCUTTA, FEBRUARY 1, 1973

Psychiatric Referrals

Psychiatry as a specialised branch of medicine has been established long ago. Still, how much the specialists are consulted by the general practitioners is still open to question. It is customary to resort to medical laboratory investigations only when symptomatic treatment fails. In such circumstances, resorting to mental testing is going to be at a still lower ebb.

Reported rate of psychiatric referrals from general practitioners is found to be low and vary considerably[1-5] (0·66—1·4 per cent). This variation in referral rates is perhaps not due to the difference in the presence of the psychiatric cases but rather perhaps the referral rate to the psychiatrist depends on various other factors. The most important of which is the doctor's mental setting, some practitioners tend to seek an organic explanation of each symptom of a patient and refer the patient to the psychiatrist only when the patient himself clearly gives evidence of emotional disorder; while the psychotherapeutically minded minority may haunt for the evidence of emotional disorder—even in every case of allergy.

Moreover, the evidence of what a psychiatrist can do for such referrals is another important determinant of psychiatric referrals. For example, knowledge of bronchial asthma, peptic ulcer, allergies, etc., as psychosomatic illness will be of no pragmatic value and will make no difference in the treatment until and unless the psychiatrist assumes special responsibility for such cases and prove that he would be more successful therapeutically than the general practitioner for such cases.

The relationship of the individual practitioner with the psychiatrist is another important factor influencing the rate of referrals. How the general practitioner evaluates the psychiatrist in question and what types of service and treatment he gets from him will determine the course of future referrals. To clarify this point a research work[6] was carried out with the help of an attitude questionnaire. The most important factors influencing the general practitioner against psychiatric referrals were found to be as follows: The patients dislike being referred to a psychiatrist, a feeling that the treatment of neurotic patients is a job of the general practitioner, delay involved in making an appointment and consultation, the unsatisfactory way in which patients are dealt with in the psychiatric clinics, consideration for the psychiatrist (knowing how busy they are) and lack of rapport between the general practitioner and the psychiatrist.

Besides the rate of referral, the most important thing is that appropriate cases are referred at appropriate times. It is said that "Referral can be too early or too late. Unwarranted and indiscriminate referral can harm the patient as well as his physician and the psychiatrist. Suicide may be an example of failure to refer in time, but harm may also ensure where too much physical investigation and treatment are carried out when there are physical symptoms of emotional origin"[7].

For this the general practitioner must have an idea of psychiatric symptoms, aetiology and diagnosis of a fundamental nature. Certainly, the presence of delirium associated with high fever should not result in referrals ; while a cured patient of mental illness must be checked up thoroughly before the operation and a cured case of peurperal psychosis should be seen again during a fresh pregnancy.

This situation places much responsibility on the shoulders of a psychiatrist. Certainly, cases with physical symptoms without appropriate physical pathology are appropriate cases for referrals even before long-drawn laboratory investigations of complex nature are embarked upon but the psychiatrist must be very cautious in the diagnosis of such cases. For any fault on his part may have drastic effects. Such diagnosis must be arrived at not by negation alone, but also by positive evidences in the personality and environmental factors.

On the other hand, the attitude of a patient to the psychiatric referral is not always very positive and helpful. For the psychiatrists and more particularly mental illnesses have a stigma attached to them. Here much can be done by the general practitioner, in preparing the patients and their relatives for such referral. A WHO[8] report states that the decision must be interpreted to the patient as opening a door to help and not as a conclusion that he is beyond help. The patient must also be assured that it does not mean loss of regard or rejection.

D. N. Nandi

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CURRENT MEDICAL LITERATURE

An Approach to Health in Latin America

AROHSON (MAJ.), M. D. SASSER (CAPT.), C. G. AND ARONSON, J. L. (*Milit. Med.*, **137**: 221, 1972) from the Public Health Section, Hq. 3rd Civil Affairs Group (Airborne), U.S. Army Forces Southern Command, write:

The authors have related their experiences with public health programmes in Nuevo Caimitillos and surrounding Panamanian villages. Success and shortcomings are briefly discussed.

The third world is made up of thousands of Nuevo Caimitillos. Their problems are complex and difficult to solve (they are even difficult to contemplate). In formulating health programmes in underdeveloped areas, many principles must be considered. We have discussed two that are particularly pertinent. In pleading for a coordinated approach, we have tried to place health in its proper perspective in a country's development, and demonstrate its dependence for improvement on other disciplines such as education, agriculture, and economy.

We have stressed the need for renewed emphasis on preventive mdicine, since this field is naturally tailored to best meet Latin America's growing health problems. We have reiterated the fallacy of looking to United States type medicine as the best means of solving these problems and have attempted to lay to rest once and for all the myth of impact medicine.

Finally, we have become convinced, as have others with a much greater wealth of experience, that adoption of these ideas is essential to the improvement and maintenance of the productive potential of the people of developing countries.

R Factors in Hospital Infection

ANDERSON, F. M., DATTA, N. AND SHAW, E. J. (*Brit. Med. J.*, **3**: 82, 1972) from the Department of Bacteriology, Royal Postgraduate Medical School. London W. 12, write:

In order to assess the clinical importance of R factors 524 "coliform" infections were studied in a general hospital. Of these, 95 were caused by *Pseudomonas aeruginosa*. Among the remaining 429, 43 per cent were caused by drug-resistant enterobacteria: resistance was frequently multiple and determined by transmissible R factors. Choice of therapy was thus limited but in every case at least one antibiotic, effective *in vitro*, was still available.

A Programme for Planned Parenthood

JAMES, T. (*S. Afr. Med. J.*, **46**: 1436, 1972) from Pinelands, Cape, writes:

Planned parenthood has become a prime necessity for the propagation of quality rather than quantity of families in any population. The uncontrolled breeding of children for whom there is no desirable future, is widely deplored. One sequel to this has been the emergence of numerous so-called family planning agencies. In this article, after a brief review of relevant circumstances pertaining to this universal problem, another attempt at a programme for family limitation is proposed for consideration of practical planners.

Every family should be able to have access to a family planning and family guidance council, where the family, in particular the newly married couple at the beginning of cohabitation, will have explained to them within educational and intellectual boundaries, the wisdom of limiting the size of any intended family they might wish to create. The wish of the couple for the number of children they would like to have, should be the determining factor, and no discouragement against any size of family should be permitted. It should be borne in mind that there are various reasons for marriage, but not so many reasons for desiring children, and if the confidential information made to councillors is properly evaluated, it is almost always possible to get a couple to come to a satisfactory agreement. All wedded couples soon after marriage would be expected to attend some such family planning and guidance council, where records of the interview would be kept, and where the partners would be expected to report annually until such a time when, should it take place, the predetermined size of the family would have been raached. Then, but still on a voluntary basis, the parents should be rendered infertile by whatever procedure has been found most acceptable in that particular locality, provided that the procedure ensures infertility.

Termination of Pregnancy During the Mid-trimester by Intra-Amniotic Injection of Urea

GREENHALF, J. O. (*Brit. J. Clin. Pract.*, **26**: 24, 1972) from Queen Mary's Hospital, Roehampton, writes:

Since the introduction of the Abortion Act in 1967 there has been an increasing number of requests for termination of pregnancy, many of which by the time they are admitted to hospital are in the mid-trimester. Several methods of terminating a mid-trimester have been reported, including intrauterine injection *via* the cervix of soapy irritant pastes of the uretusutus paste type which has been used since the 1930's. The typical postmortem were acute haemorrhagic infarction of the amygdaloid nucleus and adjacent structures, and also a Y shaped infarct in the pons, thought to be due to excessive cerebral dehydration following inadvertent intravenous or intraperitoneal injection of hypertonic saline.

The injection of 50 per cent dextrose instead of 20 per cent saline has also been favourably described. Some workers cover their intra-amniotic glucose injections with procaine benzyl-penicillin because they regard *Clostridium welchii* as the most serious infecting organism.

Intra-amniotic injection of hypertonic urea has been used in 50 consecutive mid-trimester operations for termination of pregnancy at Kingston Hospital, a preliminary communication in 10 patients having been reported in 1971. Urea was used because inadvertent intraperitoneal or intravenous injection would be far less likely to have harmful effects to the patient than hypertonic solutions of saline since high doses of urea (1.5 g./kg. body weight) have been given by rapid intravenous injection in the management of cerebral oedema.

A new method of termination of pregnancy during the mid-trimester by using intra-amniotic urea is described. The mean gestational age was 16.2 weeks, the mean interval between amniocentesis and abortion was 48 hours, the mean hospital inpatient stay 5.5 days and the incidence of foeto-maternal haemorrhage 4 out of 50 cases.

Laparoscopic Sterilisation During the Puerperium

Paterson, P. J. and Grimwade, J. C. (*Med. J. Aust.*, **2**: 312, 1972) from the Department of Obstetrics, Queen Victoria Memorial Hospital, Melbourne, write:

A series of laparoscopic sterilisations performed during the puerperium is presented. The technical difficulties involved at that time are emphasised. The place of the procedure is discussed.

Relaxation of moral and ethical attitudes has led to an increase in the number of sterilisations being performed. Recent surveys from the United Staets and Britain indicate that between 2 per cent and 3 per cent obstetric patients in those countries are sterilised during the puerperium. Tubal ligation at that time increases the length of hospital stay and the risk of thromboembolism, but for many patients it is the only acceptable time.

The present study confirms that laparoscopic sterilisation may be safely employed during the puerperium, and has demonstrated that the convalescence is more rapid and comfortable when compared with traditional procedures.

The greater mobility which results may be an important factor in reducing thromboembolic complications. This technique confers the additional advantages that intraperitoneal adhesions and their sequelae do not occur, whilst the tiny skin scars are extremely acceptable for cosmetic reasons.

It is widely believed that the performance of tubal ligation after the second day of the puerperium increases the incidence of septic complications. There was no case of pelvic sepsis in the present series. This may be attributable to the use of diathermy in the technique which sterilises the cauterised segment. It is, however, compatible with the findings of White (1966). He studied 445 patients and showed that although histological evidence of salpingitis increased as the puerperium advanced, there was no increase in septic complications.

The follow-up period after puerperal laparoscopic sterilisation in our 25 patients has been short. Nevertheless, the puerperal series of Steptoe (1971) has not been followed by any pregnancy. The efficiency of the laparoscopic technique in interval cases has been demonstrated. A recent review of 4,118 cases published in English-language journals showed a subsequent conception rate of only 0.15 per cent. This compares favourably with the failure rate for interval Pomeroy operations of 0.40 per cent and the three failures reported by Prystowsky and Eastman in 1,022 puerperal Pomeroy operations (0.29 per cent).

Sero-Epidemiological Studies on Population Groups Previously Exposed to Malaria

Bruce-Chwatt, L. J., Dodge, J. S., Draper, C. C., Topley, E. and Voller, A. (*Lancet*, **1**: 512, 1972) from London School of Hygiene and Tropical Medicine, City of Bradford Health Department, and South London Blood Transfusion Centre, write:

Application of the indirect-fluorescent-antibody (I.F.A.) test to the study of malaria antibodies in a group of Indian and Pakistani immigrants in Bradford revealed that about 50 per cent showed a positive response at a low titre against *Plasmodium falciparum* and *P. vivax*. There is little evidence of persistence of malaria infection in this group, but the test indicates the long duration of antibody acquired ten to fifteen years ago. In a group of potential blood-donors whose whole blood was not used for transfusion because of their possible previous exposure to malaria, only 24 per cent were found to have a positive I.F.A. test using *P. falciparum* and *P. malariae* antigens. A negative I.F.A. test is a good criterion of the absence of previous malaria infection.

Rectal and Pharyngeal Gonorrhoea in Homosexual Men

Owen, R. L. and Hill, J. L. (*J. Amer. Med. Ass.*, **220**: 1315, 1972) from the Centre for Disease Control, U.S. Department of Health, Education and Welfare, Atlanta, write:

To identify and treat rectal gonorrhoea in male homosexuals, a physician took rectal, pharyngeal, and urethral specimens from all of his known homosexual patients. Of 26 patients with general medical complaints five had rectal gonorrhoea, as did 19 of the 46 patients suspected of having this infection and two of seven with urethritis. Similar rectal symptoms occurred in those with and those without rectal gonorrhoea, suggesting that symptoms are not directly related to gonorrhoeal infection. Pharyngeal cultures from 11 patients were positive for gonorrhoea, but only three patients were symptomatic. Neither of two common regimens used for treatment in one visit (4,800,000 units of penicillin G procaine administered intramuscularly or 3 g. of tetracycline hydrochloride taken orally) was effective enough to use without follow-up cultures. Homosexuals are important carriers of gonorrhoea; rectal and pharyngeal cultures are essential for diagnosis and treatment of these patients.

A virus from Epidemic Vomiting Disease

Clarke, S. K. R., Cook, G. T., Egglestone, S. I., Hall, T. S., Miller, D. L., Reed, S. E., Rubenstein, D., Smith, A. J. and Tyrrell, D. A. J. (*Brit. Med. J.*, **3**: 86, 1972) from Public Health Laboratory, Kingsdown, Bristol, Public Health Laboratory, Guildford, Surrey, Central Public Health Laboratory, Colindale, London N.W. 9, Clinical Research Centre, Harrow, Middlesex and Clinical Research Centre, Salisbury, Wilts, write:

An illness consisting of vomiting, fever, and mild diarrhoea after a short incubation period was observed in a boarding school and reproduced in volunteers who received filtered extracts of faeces from a typical case. The main discriminatory diagnostic feature of the illness in volunteers was vomiting. The faeces contained no pathogenic bacteria nor any virus that could be detected in tissue cultures and there was no evidence that an infective agent could be grown in organ cultures of human intestine. The agent was shown to be ether stable and passed a 50-nm filter. Laboratory studies on another agent of uncertain significance and obtained in other epidemics are briefly described.

Ileal Mucosa in Familial Selective Vitamin B_{12} Malabsorption

Mackenzie, I. L., Donaldson (Jr.), R. M., Trier, J. S. and Mathan, V. I. (*New Eng. J. Med.*, **286**: 1021, 1972) from York Hospital, York, Pa., and the Departments of Medicine and Anatomy, Boston University Medical Centre, write:

Three brothers with selective vitamin B_{12} malabsorp-

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tion and proteinuria were studied to characterise the absorptive defect in this disorder. Gastric juice from all three brothers contained adequate quantities of biologically active intrinsic factor. Serum concentrations of transcobalamin were normal, and the patients had no demonstrable serum antibodies against intrinsic factor or against ileal receptors for intrinsic-factor-vitamin B_{12} complex (IF-B_{12}). Mucosal biopsies from the terminal ileum of one brother were normal on light and electron microscopy. Intrinsic factor markedly stimulated uptake of cyanocobalamin by homogenates of these biopsies. Thus, selective vitamin B_{12} malabsorption is not associated with a morphologically identifiable lesion, and the absorptive defect does not seem to result from lack of ileal receptors for IF-B_{12}. Rather, the defect appears at a stage of vitamin B_{12} absorption that occurs after IF-B_{12} attaches to the surface of the ileal cell and before the absorbed vitamin binds to transcobalamin.

Control of Post-Transfusion Hepatitis by Donor Selection and Case Investigation

TASWELL, H. F., SHORTER, R. and MAXWELL, N. G. (*Mayo Clin. Proc.*, **47**: 98, 1972) from the Section of Clinical Pathology, Department of Laboratory Medicine, and the Department of Pathology, Mayo Graduate School of Medicine (University of Minnesota), Rochester and Central Blood Bank of Pittsburgh, write:

Although there is no absolute method of detecting the hepatitis carrier among blood donors, much can be done to avoid the collection of blood from undesirable donors. A combination of careful donor selection, meticulous reporting of all cases of hepatitis, routine testing for H.A.A., and the judicious use of blood and blood products should prevent many cases of post-transfusion hepatitis.

The prevention of hepatitis after blood transfusion has been one of the more elusive problems of blood banking. Hopefully, the discovery of the Australia antigen has opened a phase of investigation that will give us a laboratory test or tests to detect the majority of hepatitis carriers. At present, however, only about 30 per cent of such carriers can be detected. Therefore, an attempt must be made to detect the hepatitis carrier by ancillary methods such as care in donor selection, investigation of hepatitis-implicated donors, and follow-up of transfusion recipients.

Acute Coronary Insufficiency (Course and Follow-up)

KRAUSS, K. R., HUTTER (JR.), A. M. and DESANCTIS, R. W. (*Circulation*, **45**: 66, 1972) from the Department of Medicine (Cardiac Unit), Massachusetts General Hospital, and Department of Medicine, Harvard Medical School, Boston, Massachusetts, write:

In order to provide natural history data for a common and therapeutically important presentation of coronary artery disease, the clinical courses of 100 patients with acute coronary insufficiency (ACI) were reviewed. ACI was defined as prolonged coronary pain without enzymatic or electrocardiographic evidence of myocardial infarction (MI). Patients with ACI accounted for 19 per cent of admissions to our Coronary Care Unit for ischaemic heart disease over a 27-month period. Of the 100 patients, there was only I hospital death. Six others went on to develop MI during hospitalisation; all survived. Adequate follow-up data after discharge were available for an average of 20 months. Twenty-six patients died, 8 from complications of MI, 13 suddenly, and 5 from other causes. The one-year survival was 85 per cent.

Patients who presented with the deterioration of chronic angina had a significantly increased mortality over those with recent onset of ACI. The presence of MI prior to admission and of in-hospital complications was not significantly prognostic for mortality in follow-up. All the in-hospital myocardial infarctions and the single hospital death occurred in the group of patients with recurrent pain at bed rest.

The effect of medical therapy on the course of ACI could not be adequately assessed, but prompt hospitalisation may in itself prevent progression to infarction. The relatively good short-term outlook for patients with ACI makes it advisable to apply revascularisation with some restraint. Controlled prospective studies of surgical and nonsurgical treatment of ACI are indicated.

Chronic Mucocutaneous Candidiasis Influence of Thyroid Status

MONTES, L. F., PITTMAN, C. S., MOORE, W. J., TAYLOR, C. D. AND COOPER, M. D. (*J. Amer. Med. Ass.*, **221**: 156, 1972) from the Departments of Dermatology, Endocrinology and Paediatrics, University of Alabama in Birmingham Medical Centre, Birmingham, Ala, write:

It has been said that Candida albicans can be a better clinician than most physicians and may detect systemic abnormalities before they are recognisable at the laboratory level. Chronic mucocutaneous candidiasis developed in a 7-year-old boy long before a diagnosis of marked hypothyroidism (thyroid stimulating hormone, 825 μU/ml.; T_4 test (tetraiodothyronine), 0.3 μg./100 ml.) could be established. Normalisation of the thyroid status by replacement therapy resulted in dramatic improvement of the infection which had previously been resistant to prolonged anticandidal treatment.

CURRENT TOPIC

A Survey Report on Smoking Habits of Men in Rajasthan

AJIT SINGH BHOWN*, TEJ INDER SINGH**
MEERA BHOWN***
BRIJ BEHARI MAITRYA****

Surveys on smoking habit have been conducted in various parts of the world in order to determine any causal relation with ill health (Doll and Hill, 1964;

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**** M.B.B.S., M.Sc., Professor and Head

Brett and Benjamin, 1968; Dalton and Curran, 1970; Monson, 1970; Morris and Tichy, 1970; Pambert and Reid, 1970). This paper stems from an attempt to determine the pattern of smoking habits in Rajasthan.

MATERIAL AND METHOD

A questionnaire was prepared and distributed at random irrespective of age and social status amongst college students, teachers, doctors, engineers, military personnel, administrators and businessmen in some of the big cities of Rajasthan, particularly in Bikaner. Only those who had regular smoking habits at the time of survey were registered as smokers. All those who had left smoking and those who had no previous history of smoking were registered as non-smokers. Furthermore, smokers other than cigarette smokers viz., *bidi*, etc., were not included in this study. The questionnaires were grouped category-wise and the results tabulated.

RESULTS

Out of 2,000 questionnaries, 1742 (87·1 per cent) were received back. The responders were between 17-60 years of age.

752 (42·0 per cent) respondents were found to be smokers and gave history of smoking for the last 1 to 30 years, they were 18 to 60 years of age. 64·5 per cent of them started smoking at an early adolescent age and 2·0 per cent started smoking as early as 8 years of age.

In this study, military personnel had 68·6 per cent of smokers, the highest percentage amongst all the categories studied followed by doctors (50·9 per cent) while the teachers had the lowest percentage (26·5 per cent) of smokers.

1 to 5 cigarettes were smoked per day by 69·1 per cent of college students, the highest in this group; whereas, in the group following this, 6 to 10 cigarettes/day, doctors with an average of 33·3 per cent were amongst the highest. There has been no appreciable number of those who smoke 11 to 15 cigarettes per day but the group smoking 16 to 20 cigarettes/day included doctors again with 23 3 per cent. Military personnel were found to lead in the group of those smoking 21 to 25 cigarettes/day.

In response to questions 8 and 9 (Question 8—Why do you smoke? Do you smoke for company's sake, do you feel like smoking, is it a must for you, can't you work without it, any other remark. Question 9—You smoke while working/discussing/reading, talking, worrying/any other time) of the questionnaires more than one answers were given by almost all the smokers. It was evident that 57·7 per cent college students and 40·0 per cent doctors 'smoke for company's sake' only. Amongst those who 'feel like smoking' are military personnel, 68·0 per cent; teachers 53·3 per cent and doctors 46·6 per cent whereas 40·0 per cent of the doctors also feel that they 'must smoke'. On an average (i) 'smoking for company's sake' and (ii) 'feeling for smoking' were the two main reasons for this habit.

It is clear that smokers do change their smoking frequency depending upon 'as to how they are occupied professionally or otherwise'. One such is 'working' which increases the smoking frequency of 60·6 per cent of military personnel and 30·0 per cent office assistants. While 'discussion' has the least effect, 'reading' increased the frequency to 34·4 per cent in college students and 36·6 per cent doctors. 'Talking', seems to be another contributory factor which increased this habit for 31·1 per cent college students and 46·6 per cent doctors. Of all the answers listed for question 9, 'worry' is possibly one which has the maximum stimulus—36·4 per cent on an average—for the increase and notably so for military personnel and college students, 60·0 per cent and 37·7 per cent respectively.

Not many persons, out of those surveyed, seem to have felt discomfort as a result of smoking though 56·2 per cent of the smokers are interested in giving up this habit.

DISCUSSION

On an average 42·0 per cent of the population surveyed was found to be smokers. Amongst different categories surveyed military personnel were found to be leading with 68·6 per cent smokers.

The study revealed some interesting correlations in certain categories. One such relationship is between the number of cigarettes smoked per day and the reason for smoking. It was found that those who 'smoke for company's sake' smoked comparatively smaller number of cigarettes as in the case of college students. In addition to this an increase in the number of cigarettes per day is also related to the type of work in which the smoker is engaged. College students have been found to increase their smoking habit while 'reading' whereas, military personnel and office assistants during 'working'. Another inference which could possibly be drawn is that almost all categories studied increase their smoking frequency during 'worry'.

On comparing the average figures of different categories of smokers with those avaiable in the literature no alarming difference was noted. Morris (*loc. cit.*) found 29·2 per cent school coaches to be smokers, a figure close to that of teachers (26·5 per cent) in the present survey. Monson (*loc. cit.*), in a follow-up study, found that the physicians of Massachusettes had 51·8 per cent and 24·0 per cent smokers in the year 1954 and 1968 respectively indicating a declining trend. In another report presented by Burges and Tierney (1970) it has been concluded that 22·6 per cent of the physicians were engaged in smoking. In this report, 50·9 per cent doctors were found to be smokers and thus the value approximates to the one reported by Monson (*loc. cit.*) for the year 1954 for physicians.

Smoking habit of students too was found to be not much different from those reported by Dalton and Curran (*loc. cit.*), which is 33·0 per cent for medicos of the United Kingdom as compared with 35·6 per cent for college students in the present report. No comparison could however be made for other categories surveyed in this attempt for want of reports in the literature.

SUMMARY

An attempt has been made to collect information regarding the habits of smoking in Rajasthan. The outcome of such an attempt may be summarised as: That 42·0

per cent of the population studied belonged to the class of smokers, out of which a high percentage starts smoking at an early adolescent age. 'Smoke for company's sake' and 'feel like smoking' have been found to be two main factors responsible for smoking habits. One more admitted fact had been that 'worry' causes maximum stimulating effect for an increase in the number of cigarettes smoked per day.

ACKNOWLEDGMENT

Financial assistance from University Grants Commission, New Delhi, India, is gratefully acknowledged.

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CORRESPONDENCE

The Editor is not responsible for the views expressed by correspondents

The F.R.C.S. (England)

SIR,—The editorial "The F.R.C.S. (England)" which has appeared in your esteemed Journal (*J. Indian M. A.*, **59**: 442, 1972) is very opportune. I am whole-hearted in agreement with you about the intense desire of those young medical graduates who can afford the wherewithal, to aspire the F.R.C.S./M.R.C.P./M.R.C.O.G., etc., of the United Kingdom and now the various diplomas of the American Speciality Boards. These hall-marks carry with them the assurance that the holder has attained that knowledge and competence in the respective subjects, as to enable him with a fair amount of certainty to enter the consultant/speciality field of the subject of his choice. It will not be a matter of surprise if in time to come some of our young medical graduates, provided they have the time to acquire the language, aspire to the specialities granted by U.S.S.R./Europe/Japan.

The main reason to my mind is that these examining bodies abroad, grant their certificates only to such candidates as are fit and competent to acquire the diplomas. No extreneous matters enter into it at all. The standards required are strict and are respected all over the world. No doubt some of the Royal Colleges in U.K. have a hoary past, where the standards of competence now required have been tried over years and through experience, the mistakes committed ironed out. But even the more recent of the diplomas of the newer Royal Colleges in U.K. and of the Speciality Boards of U.S.A. are not easily obtainable. The grind of hard work and necessary experience are prerequisites to obtain them. No wonder then that many of our eager graduates knock at these gates, where few are chosen, who then become the elite of the profession anywhere.

Compare in contrast the M.S./M.D. of the various Indian universities, where you have rightly pointed out the total lack of standard and organisation. Every medical graduate desires and often succeeds to get the M.S./M.D., whether deserving or not. The degree of M.B.B.S. is not considered enough to be a basic doctor. The fault in training and the standard of the degree obtained, therefore extends right through the undergraduate to the postgraduate.

In 1967-68 I had the opportunity to preside over Selection Boards in the U.P.S.C. for Central Health and Railway Medical Services. I interviewed a number of M.D.s/M.S.s for these appointments. In my report to the U.P.S.C., I had remarked that the knowledge displayed by the M.D.s./M.S.s. was so perfunctory that it was less than the knowledge of a graduate who had acquired an M.B.B.S. 25 years ago and the knowledge of an M.B.B.S. was perhaps equivalent to an L.M.P. of past years. In the rush to create a large number of medical colleges we have sacrificed quality for quantity. The knowledge displayed by the M.D.s/M.S.s in the interview was in inverse ratio, to the pride and arrogance of having obtained the M.D./M.S.

In your last para you have appealed for a uniform standard in the country. In this connection I am surprised that you have not mentioned the Indian Academy of Medical Sciences which was founded over 10 years ago with the express objective of having that standard of uniform competence which would be a hall-mark for entrance to the specialist/consultant field and in time replace the F.R.C.S./M.R.C.P., etc., so ardently desired by many of our graduates. But as usual it seems to have bogged down in the various medico-political meanderings, which unfortunately, is so characteristic in the various spheres of activities in the country.

One final word and that is that our basic or our higher qualifications will never attain any international status until original work and not just research, which is a repetition of what others have done elsewhere, becomes the aim, object, and what is more important, is actually done in the country.

I am, etc.,

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C. C. KAPILA, M.B., F.R.C.P.
F.A.M.S., D.M.R.E.
D.T.M. & H., LT. GENERAL (R.)

REVIEWS

Aspects and Treatment of Vulvar Cancer (1st International Symposium on Vulvar Cancer, Madrid, 1971)—Editor: L. Lopez de la Osa, 1972, S. Karger, Basel, Munchen, Paris, London, New York, Sydney; 24 cm.×17 cm.; pp. X+206; S.Fr. 75.-/US $21·00 DM 68.-/£8·25.

Records of a symposium in book forms are of considerable and lasting value if the terms of reference of the symposium are sufficiently narrow. The work then becomes a fairly comprehensive treatise of the subject. The symposium, recorded here, was held in Madrid under the direction of the National Institute of Cancer, Madrid. Participants, numbering about 27, came from Spain, the United Kingdom, the United States of America, Ireland and Switzerland. The subject matter of the symposium on various aspects of vulvar cancer has been grouped under the headings of anatomical pathology, clinical classification, histopathological and electron microscopic characteristics, epidemiological and clinical study, different techniques of early diagnosis of the lesion and their prognostic value and scope of Surgery and Radiotherapy in Vulvar Carcinoma. Although this volume is supposed to be from the proceedings of an International Symposium, most of the contributors (21 cut of 27) hail from Spain thereby detailing the works mainly done in Spain on the problems of Vulvar Cancer.

For the pathologist, electron microscopist, oncologist and radiobiologist there will be much in this volume that will excite interest and further studies on this problem. The gynaecologists will get a clear picture of the recent technical advances that have helped to improve the diagnosis, prognosis and treatment of Vulvar Cancer.

N. N. Roy Chowdhury

Greek Medicines in Asia and Other Essays—By S. L. Bhatia, 1970. Indian Institute of World Culture, Bangalore, 19 cm. × 13 cm.; pp. viii+226 (3 plates on art paper); Rs. 12·00.

The book may be found interesting to those who care to know about our medical heritage or those interested in sturdy future of India who believe that "Past is only the prologue". All but one of the essays presented in this book are compiled from different lectures delivered by the author from different platforms. As such there is unavoidable repetition of facts in the book.

The essays can be broadly classified into two groups (a) those dealing with history of medicine and (b) those on medical education in India. The historical discourses, specially those dealing with Arabian medicine and medicine practised in Mughal courts, are sure to delight the readers, though some statements might leave them wondering. For example, as documentation was poor in ancient India, antiquity of Charaka or Susruta over Hippocrates "by centuries" is questionable. Then again, if Alexander's invasion of India (327 B.C.) was the chief source of Eastern influences on Greek medicine, then Hippocrates (460-357 B.C.) and the cult laid down by him was more a product of complacency of the Marathon war (490 B.C.) than of Indian export. The statement that theory of humoural qualities of human body was introduced in Greek medicine by Hippocrates (p. 2) is denied by some; W. Haggard, in his book "Devils, Drugs and the Doctor" (Cardinal Ed. Pocket Book Inc. 1959, p. 355), accredited Galen for the same.

The essays on medical education only reflect the vast experience of the author as a teacher. In these days of student unrest in India, it will be good for all concerned to remember the oftrepeated, but hardly-heeded-to advise "There is need for establishment of a happier atmosphere in our teaching institutions" (p. 55). Again, one could not agree with him more when he says "The study of medicine should thus embrace the study of life in all its aspects—physical, psychological and social." But the author has not ended by indicating the duties of a doctor to the society, he has also stressed on the duty of the society towards the profession. "Society lays the foundation for that unity and friendship which is essential to the dignity and usefulness of the profession." A society which fails to impart that dignity and usefulness to our profession is surely at fault.

Srikumar Roy

OBITUARIES

Dr. M. M. Mehta

Dr. Mulchand Manekchand Mehta was born at a village in Saurashtra (Gujarat) in 1922. After passing the Matriculation Examination in 1940 from a high school in Morvi, he studied at the Wilson College, Bombay. He was a brilliant student and a good sportsman as well. He graduated in medicine from G. S. Medical College, Bombay and served as resident radiologist at the K.E.M. Hospital from 1948 to 1951. In 1951 he left for U.S.A. to join a big hospital at Chicago as resident radiologist. He returned in 1953 after prosecuting higher studies in radiology and obtaining the A. I. C. S. (U.S.A.). Thereupon he rejoined the K. E. M. Hospital and qualified for D.M.R.E. of the Bombay University. Subsequently he was promoted as chief radiologist and Professor of Radiology, G. S. Medical College and K. E. M. Hospital, in 1968.

Dr. M. M. Mehta

Dr. Mehta was very popular with his colleagues and patients and was esteemed for his sound x-ray reports. He was also a popular teacher and examiner for M.D.M.R.E. of Bombay, Gujarat and other universities.

He was a member of the I.M.A., Bombay Branch and President of the Bombay Branch of All-India Radiologist Association. He was also attached to several reputed institutions of the city including Rajavadi Municipal Hospital and B.E.S.T. Clinic.

Dr. Mehta's bright career came to an abrupt end at the age of 51 following a heart attack on 31-10-72. He leaves behind his wife, two sons and a daughter.

Dr. Shambhu S. Sinha

Death occurred on 31-12-72 of Dr. Shambhu Sharan Sinha, medical officer-in-charge of the T. B. Centre, Sadar Hospital, Ranchi.

Dr. Sinha graduated in medicine in 1947 and shortly joined the Bihar Health Service. He qualified for the D. T. D. in 1955.

He was an active member of the I.M.A. and was a member of the Executive Committee of the Ranchi Branch. He was also elected a representative to the Bihar State Council of I.M.A.

SUPPLEMENT
JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

VOL. 60, NO. 3 CALCUTTA FEBRUARY 1, 1973

Association Notes

Observance of All-India Black Day on 16th April, 1973

Action Committee of I.M.A. to Meet at Patna on 25-2-73 to Finalise Detailed Programme

Pursuant to the decision taken at the meeting of the Central Working Committee and the annual meeting of the Central Council of I.M.A., the Action Committee circulated to all State Branches a provisional programme inviting suggestions for observance of All-India Black Day. Thousands of letters along with suggestions have been pouring in from different parts of the country to the office of the Action Committee, which are being processed. The Action Committee has further invited all State Branch Secretaries to attend a meeting at Patna on 25-2-73 to help it in finalising the programme. In case of any difficulty on their part in personally attending the meeting, the State Branch Secretaries have been particularly requested to send at least one accredited representative of the State Branch, who can apprise the Action Committee of developments in their respective States. The State Branch Secretaries have also been advised to undertake preparatory organisational work for observance of the Black Day on 16th April, 1973.

Kerala Government's Proposal to Register "Tahsildar—certified" Quacks

State-wide Protest Campaign Launched by I.M.A. Kerala State Branch from 1st February 1973

The Kerala State Branch of I.M.A. held an emergent meeting of its Working Committee at Trichur on 21-1-73 to consider the situation arising out of the enactment of Kerala Medical Practitioners Bill which has been referred to a Select Committee of the State legislature.

Dr. J. Majumdar, Chairman, Action Committee, attended the meeting on the advise of the President of I.M.A. The meeting was presided over by Dr. N. Mohandas, President, Kerala State Branch. Dr. Thyagarajan, Hony. State Secretary, informed the Committee that Kerala State Branch had already appointed a sub-committee to scrutinise the Bill and submit a report. On the basis of this report the I.M.A. Kerala State Branch will draw up its recommendations to be placed before the Select Committee.

Dr. Thyagarajan deplored that the Bill sought to regulate the practice of modern medicine along with homoeopathy and indigenous medicine through 3 different councils, which was not only unnecessary but also unwarranted. He said the Medical Council of India, which was constituted as a statutory body by virtue of an enactment of the Parliament, is the competent authority to decide about the qualifications to be recognised for modern medicine and the State Medical Councils should abide by the guidelines set by the superior body.

Dr. J. Majumdar, Chairman, Action Committee, I.M.A., said he was shocked to learn that such a repugnant Bill had been introduced in the State legislature of Kerala. The most objectionable part of the Bill, he pointed out, was the provision for registration of unqualified and untrained persons who were illegally practising modern scientific medicine on the strength of certificates by Tahsildars. Explaining the stand taken by I.M.A. in this regard, he said the I.M.A. has submitted to the Government of India and to all State Governments its considered views as to the norms to be maintained in the practice of modern scientific medicine, which was making rapid strides and was developing almost daily with the introduction of new complex drugs. The I.M.A. was making all persuasive efforts, he said, to restrain the Government from registering the unqualified persons, which would not only adversely affect the peoples' health but also retard the progress of science in the field of medicine and health care of the country. It was deplorable, Dr. Majumdar said, that the Union Health Ministry had issued a circular inducing the different State Governments to bring about legislation for registration of quacks and the type of Bill introduced in Karala State must have drawn inspiration from this circular. In such a situation, Dr. Majumdar observed, the I.M.A. had no other way out than to launch an agitational campaign to warn the countrymen of the dangerous consequences of such an anti-national and anti-people move of the Government. In its recent annual session at Ahmedabad the I.M.A. had issued a call to all State units to observe All-India Black Day on 16th April with a view to highlighting the opposition of the national organisation of the medical profession to the above move of the Government and upholding the interest of scientific health care of their fellow countrymen. Referring to the exigency for the medical profession created by the Kerala State Government's move in introducing a Bill, which was now lying with the Select Committee of the State's legislature, Dr. Majumdar said, that was the reason why the I.M.A. had called upon the Kerala State Branch to launch a State-wide protest campaign in Kerala from 1st February, 1973.

Almost all the zonal leaders of I.M.A. in Kerala, who attended the meeting registered their unanimity with the views expressed by the previous speakers. Summing up the discussions Dr. N. Mohandas, President, declared that there would be meetings at all district headquarters of Kerala on 1st February, which would mark the first phase of the campaign. Along with it, representations would be made to the members of the Select Committee for deletion of the objectionable clauses of the Bill, particularly those pertaining to the practice of modern scientific medicine. He emphasised that only the recognised qualifications of the Indian Medical Council should be registrable in the State of Kerala as also in other States. He assured Dr. Majumdar that keeping with the resources and ability of the Kerala State Branch everything will be done to ensure the success of the campaign and the All-India Black Day will be observed in a manner so that it makes an impact on the thinking of the Government and the minds of the people.

Thanking the leaders and organisers of the Association in the State, who had assembled on this occasion and expressed their solidarity with the cause, Dr. Majumdar made it clear that the I.M.A. had nothing against the registered homoeopaths and registered practitioners in the indigenous systems of medicine. The I.M.A. wanted the people to choose which system they would prefer for their medical care. The I.M.A., would never agree to adulterate the scientific norms and standard of modern scientific medicine, he asserted, as it did not subscribe to the view that there was non-availability of the required strength of qualified men in the country. What the country was really lacking, he observed, was a proper and scientific health planning for implementation in a phased manner; where it was failing was in providing the requisite quantity of drugs and equipment, and number of nurses and paramedical staff. Above all, he added, the health planners themselves were lacking in their determination to utilise the qualified medical men properly in the service of the people.

RELEVANT EXTRACTS
from
THE KERALA MEDICAL PRACTITIONERS BILL, 1972

A
Bill

to regulate the qualifications and to provide for the registration of practitioners of modern medicine, homoeopathic medicine and indigenous medicine with a view to encourage the study and spread of such medicines and to consolidate and amend the law relating to medical practitioners generally in the State of Kerala.

Preamble—WHEREAS it is expedient to regulate the qualifications and to provide for the registration of practitioners of modern medicine, homoeopathic medicine and indigenous medicine with a view to encourage the study and spread of such medicines and to consolidate and amend the law relating to medical practitioners generally in the State of Kerala;

BE it enacted in the Twenty-third Year of the Republic of India as follows:

PART I
Preliminary

1. *Short title, extent and commencement* — (1) This Act may be called the Kerala Medical Practitioners Act, 1972.

(2) It extends to the whole of the State of Kerala.

(3) This section shall come into force at once; and the remaining provisions of this Act shall come into force on such date as the Government may, by notification in the Gazette, appoint.

............*vide Page 1*

PART II
Establishment of Councils

3. *Establishment, incorporation and constitution of councils*—(1) The Government shall, by notification in the Gazette, establish the following three councils, namely:

(a) the Council of Modern Medicine;
(b) the Council of Homoeopathic Medicine; and
(c) the Council of Indigenous Medicine.

(2) Every Council established under sub-section (1) shall be a body corporate, having perpetual succession and a common seal and shall by the said name sue and be sued.

(3) The Council of Modern Medicine shall consist of the following members, namely:

(a) The Director of Health Services, *ex officio;*

(b) one member from each University in the State elected by the members of the Medicine of that University from among themselves;

(c) three members, one elected by the teachers of the Medical College, Trivandrum, from among themselves, one elected by the teachers of the Medical College, Kottayam, from among themselves and one elected by the teachers of the Medical College, Kozhikode, from among themselves;

(d) one member from each revenue district elected by the qualified registered practitioners of modern medicine of that district from among themselves; and

(e) two members nominated by the Government.

(4) In making nominations under clause (e) of sub-section (3) the Government shall have due regard to the

claims of women, of medical missions and of other groups of practitioners, representatives of whom have not been elected by the electorates referred to in clauses (b), (c) and (d) of sub-section (3).

...........*vide Page 3*

20. *Registers*—(1) There shall be separate registers for modern medicine, homoeopathic medicine, ayurvedic medicine, sidha medicine and unani tibbi medicine. The registers shall be in such form and shall contain such particulars as may be prescribed by rules.

(2) The register for modern medicine shall be divided into three parts A, Al, and B.—

(i) Part A containing the names of practitioners holding recognised qualifications ;

(ii) Part Al containing the names of persons registered in pursuance of clause (ii) of sub-section (1) of section 24 ; and

(iii) Part B containing the names of persons registered in pursuance of clause (ii) of sub-section (1) or sub-section (5) of section 22 or clause (iii) of sub-section (1) of section 24.

...........*vide Page 10*

Registration

(2) Applicants for registration under clause (ii) of sub-section (1) shall produce a certificate in Form 1 as set forth in the schedule. *The certificate shall be from an officer of the Revenue Department not below the rank of a Tahsildar* or any other person authorised by the Government in this behalf.

...........*vide Page 12*

FORMS

Form I

Certificate of Five Years Practice Referred to in Section 22 (2)

Office of the.................
Dated...........................

On the basis of the records in this office or facts known after due inquiry I certify that Sri..................... has been shown or proved as following the occupation of a practitioner of the.......................medicine for not less than five years as shown below:

(a) at 1 (b) from...............to...............
2 from...............to...............
3 from...............to...............

1. The date of birth of the applicant
2. Present occupation of the applicant
3. Father's name and occupation
4. Other occupations (if any) of the applicant

Signature
Designation

(a) Here enter the name or names of the place or places where the applicant is shown as practising or having practised.

(b) Here enter the dates showing the beginning and termination of practice in each place.

N.B.—(1) The certificate should bear the date stamp of the office of issue, if any.

(2) The printed wording in the certificate should not be altered.

(3) Other occupations to be noted in this column are other occupations followed during the periods of practice noted above.

...........*vide Page 28*

Branch Notes

ANDHRA PRADESH STATE BRANCH

Gulbarga Branch — The annual general meeting was held on 3-10-71. Dr. M. K. Nagathan presided in the absence of Dr. Maslekar who was on an official visit to Bangalore.

The following were elected office-bearers for 1971-72:

President—Dr. M. S. Hanashetty ; Vice-President—Dr. T. Ambadas Rao ; Hony. Secretary—Dr. B. T. Paladi ; Joint Secretary—Dr. Bhaskar Mall ; Treasurer—Dr. R. Srikantaiah ; Executive Council Members—Drs. (Mrs.) P. Annapurna, M. Chandrashekar, (Mrs.) L. V. Grampurohit, Antani Jayant, Kasturilal, V. C. Mailapur, M. K. Nagathan, G. V. Naik, H. S. Raju, G. V. Sambrani, A. Shivashankar, S. B. Sunkad ; Representatives to State Council—Dr. Muralidhar Rao, Dr. (Miss) Pushpa Kawathekar and Dr. H. V. Srinivas ; Representatives to Central Council—Dr. R. N. Shetti and Dr. H. S. Raju.

Krishna Branch —The annual general meeting of the branch was held on 24-10-71 at Dr. Giri Home of I.M.A.

Earlier the executive committee met with Dr. T. Suryaprakasa Rao in the chair. The annual report and the audited statement of accounts for 1970-71 as placed by the Hony. Secretary were scrutinised and approved.

The general body met with Dr. T. Suryaprakasa Rao in the chair.

A resolution was passed condoling the demise of Dr. N. Sethumadhava Rao, a member of the branch and Dr. P. Manikyaraju, President—elect of the State Branch.

The following were elected office-bearers for 1971-72:

President—Dr. T. Suryaprakasa Rao ; Vice-President—Dr. L. Chandrasekhara Rao ; Hony. Secretary and Treasurer—Dr. D. Subba Rao ; Joint Secretary—Dr. V. Rambabu ; Members of the Working Committee—Drs. B. K. Raju, I. Koteswara Rao, V. Radhakrisrna Murthy, M. Subba Rao, P. Narasimha Murthy, (Mrs.) D. Latha Devi and M. A. Padmanabha Rao ; Representative to State Council—Dr. G. Lakshmana Rao ; Representative to Central Council—Dr. K. Venkatrama Sastry ; Auditor—Sri K Radhakrishnamurthy.

The following resolution as recommended by the Executive Committee was passed unanimously:

Resolved to collect Rs. 20/- only from the mofussil members towards the annual subscription instead of Rs. 31/- as was being done previously.

The scientific session started with Dr. T. S. Prakasa Rao in the chair. Dr. Rao thanked the members for electing him again as President and assured them of his co-operation.

At the outset Dr. V. Radhakrishnamurthy, who won the Dr. Yellapragada Subba Rao Memorial Essay competition on "Amoebiasis and Its Management", read his prize essay.

Dr. A. Sankara Rao, Professor of Psychiatry in Guntur Medical College, spoke on Neuroleptics in Psychiatry Dr. T. Sreenivasan, Professor of Principles and Practice of Medicine, Guntur Medical College, spoke on Management of Anaemias.

Dr. (Mrs.) N. Subhadradevi, Vice-Principal and Professor of Obstetrics and Gynaecology, Guntur Medical College, spoke on Hypertension in Pregnancy.

Dr. T. Suryaprakasa Rao summed up the proceedings.

Dr. (Mrs.) N. Subhadra Devi, who was present as the chief guest, gave away the prizes for various events. The following were the recipients:

(a) *Dr. Yellapragada Subba Rao Memorial Essay Prize*—1. Dr. V. Radhakrishnamurthy. 2. Dr. M. A. Padmanabha Rao, 3. Dr. B. K. Raju. 4. Dr. P. Govinda Rao ; (b) *Quiz Competition*—1. Dr. M Subba Rao. 2. Dr B. V. Appa Rao, 3. Dr. P. Narasimha Murthy ; (c) *Attendance*—1. Dr. I. Koteswara Rao, 2. Dr. M. Subba Rao. 3. Dr. V. Radhakrishnamurthy.

The special prize for mofussil doctors went to Dr. G. Lakshmana Rao and the same for lady doctors went to Dr. (Mrs.) T. Sarojini.

MAHARASHTRA STATE BRANCH

According to the annual report for the year 1970-71 as adopted at the State Council meeting held at Akola, the membership of the State Branch at the beginning of the year was 2597 including 121 couple members and at the end of the year it was 3536 including 258 couple members. During the year under review there were 90 local branches. Two branches were suspended, one branch was regularised and one new branch was formed bringing the total to 89.

During the period there were three meetings of the Working Committee and one meeting of the State Council. The executive committee met twice during the year at Amraoti and at Sholapur respectively. In both the meetings there was a discussion on C.F.C. arrears. It was decided to send reminders to the branches asking them to clear off all their dues before 20-9-71. The President, State Secretary and the Treasurer were authorised to suspend defaulting branches thereafter. It was also decided that Dr. V. K. Toraskar should work as Hony. Joint Secretary for the remaining period of the year in place of Dr. Ranadive, who expired in February, 1971.

The Hony. State Secretary reported the progress of negotiations with the Bombay Branches of I.M.A. Dr. Thakare, Dr. Panwala and Dr. Menda explained in details the problem following which the Hony. State Secretary rounded up the whole discussion. An appropriate decision to end the impasse was taken thereupon.

As per the decision taken in the executive committee meeting held on 6-11-70, 6 new sub-committees were formed with the following members:

(i) *Pay Scale Committee*—Drs. D. V Desai (Chairman), D. W. Hardas (Convener), M. G. Bhide, B. M. Dandekar and M. D. Khannurkar. (ii) *Medical Education Committee* — Drs. V. D. Kirpekar (Chairman and Convener), V. S. Pryag, R. K. Menda, M. R. Chowdhury, G. S. Mutalik and M. T. Paitharkar. (iii) *Drug Committee* — Drs. M. A. Panwala (Chairman), (Mrs.) Lalita Rao (Convener), N. B. Bapat, P. N. Hoshing, S. D. Athavale and S. C. Mehta. (iv) *E.S.I. Committee*—Drs. D. S. Munagekar (Chairman), K. D. Udgaonkar (Convener), M. P. Bawle, V. S. Kashikar, B. D. Kalgutkar and H. K. Ambike. (v) *Action Committee*—Drs. M. G. Bhide (Chairman), M. V. Dharwadkar (Convener), B. B. Shah, R. M. Bendre, M. H. Sarode and B. M. Gokhale. (vi) *Family Planning Committee*—Drs. D. N. Pai (Chairman), P. S. Alsi (Convener), V. K. Toraskar, A. G. Sathe, B. V. Gokhle, P. N. Hoshing and R. N. Wagh.

The Hony. Secretary also informed the house of the formation of a sub-faculty of I.M.A. College of General Practitioners in Bombay and that of the appointment of Dr. B. D. Kalgutkar as convener of the Ad hoc Committee.

As per the decision taken in the executive committee meeting at Sholapur the Hony. State Secretary had written a letter to the I.M.A. (Centre) about D.M.Ps. The Hony. State Secretary was a member of the delegation which waited upon the Union Minister for Labour, Sri R. K. Khadilkar, and discussed with him the question of increasing the capitation fees for E.S.I. medical practitioners.

In compliance with the direction of the Action Committee the State Branch befittingly observed the All-India 'Doctors in Employment' Demands Day on 1-9-71. The members of the local branches wore protest badges and held special meetings, symposia and press conferences wherever possible. Copies of the memorandum on the service conditions of doctors as prepared by the Hony. State Secretary was sent to the Chief Minister and the Minister for Health, Maharashtra.

President Dr. Thakare and Vice-President Dr. P. S. Alsi reported to the house the progress of the tour programmes which they undertook during the year. The President informed the house that he attended a meeting of the State Leprosy Advisory Board on behalf of the State Branch and on that occasion met the members of Wardha Branch of I.M.A., among whom many members of the staff of Sewagram Medical College were present. He also visited the branches at Pusad, Digras and Anjangaon-Surji.

Nagpur Branch — The branch organised its second re-orientation course on 26-9-71 at the I.M.A. House, Nagpur. Dr. R. C. Verma and Dr. A. C. S. Jain—both from Indore were present on this occasion as guest speakers. The course was inaugurated with the presidential address by Dr. H. S. Bhargava, who stressed in his speech the need for keeping the general practitioners fully informed of the latest developments in the medical science, as it was they who constituted the backbone of the national health. Dr. Khandelwal, Vice-President of the branch, introduced the gust speakers who originally hailed from Nagpur.

The main features of the refresher course were a symposium on Anaemia and scientific talks given by distinguished teachers. Drs. S. N. Chandurkar, V. B. Sanghi, A. S. Parande and (Mrs.) Rohatgi took part in the symposium. Dr. A. C. S. Jain spoke on Obesity and Dr. R. C. Verma on Talipes Equinovarus commonly known as Club Foot. Prof V. Marah and Dr. H. C. Nirula spoke on T.B. Spine and Tumours of the Breast respectively. Prof. P. N. Dube discussed anatomic implications with regard to Talipes Equinovarus.

Dr. P. N. Prodhan was felicitated by the members on his election as Vice-President of I.M.A. (Centre) for 1971-72. Dr. R. T. Lakhe thanked the speakers.

MYSORE STATE BRANCH

Dharwar Branch — The annual general meeting was held on 30-9-71. The annual report for the year 1970-71 was placed by the Hony. Secretary. According to the report, the branch held 18 meetings during the year. It observed the World Health Day at a function which was inaugurated by Dr. C. Bhasyam, District Surgeon, and presided over by Dr. V. V. Pavate, President of the branch. A symposium was held on the theme "A Full Life Despite Diabetes". The participants in the symposium included Drs. (Smt.) T. V. Patil, D. G. Kalburgi, B H. Kamalapur, R. S. Neglur, A. K. Kale, S. M. Vainganka r and N. B. Nadgir. The branch organised a baby show at the end of which prizes were distributed to the winners by Dr. S. N. Kirdikeri. It also held a social gathering for the members in the garden of Dr. B. H. Kamalapur at Sadhankeri, and arranged a film show for them by courtesy of Suhrid Geigy Ltd.

At different meetings talks were given on interesting clinical subjects. The speakers included Drs. S. S. Shivanagi, B. G. Deshpande, A. N. Venkatesh, S. M. Vainganka r, P. Koteshwar Rao, A. N. Kabbur, A. N. Jamadar, R. S. Neglur and R. H. Kulkarni.

Dr. A. K. N. Sinha, President and Dr. M. A. Panwala, Vice-President of I.M.A., visited the branch on 23-8-71. They addressed a special meeting which was held in their honour.

The branch befittingly observed the "Doctors in Employment" Demands Day on 1-9-71. Badges were worn by the members and a printed copy of the I.M.A.'s memorandum was sent through the Assistant Commissioner, Dharwar, to the Prime Minister of India.

The following were elected office-bearers for the year 1971-72:

President—Dr. V. V. Pavate; Vice-President—Dr. B. G. Deshpande; Hony. Secretary — Dr. N. B. Nadgir; Internal Auditor—Dr. S. S. Bhavikatti; Treasurer — Dr. M. V. Kanetkar; Representative to Central Council—Dr. B. H. Kamalapur; Representative to State Council—Dr. (Miss) N. R. Hukkeri

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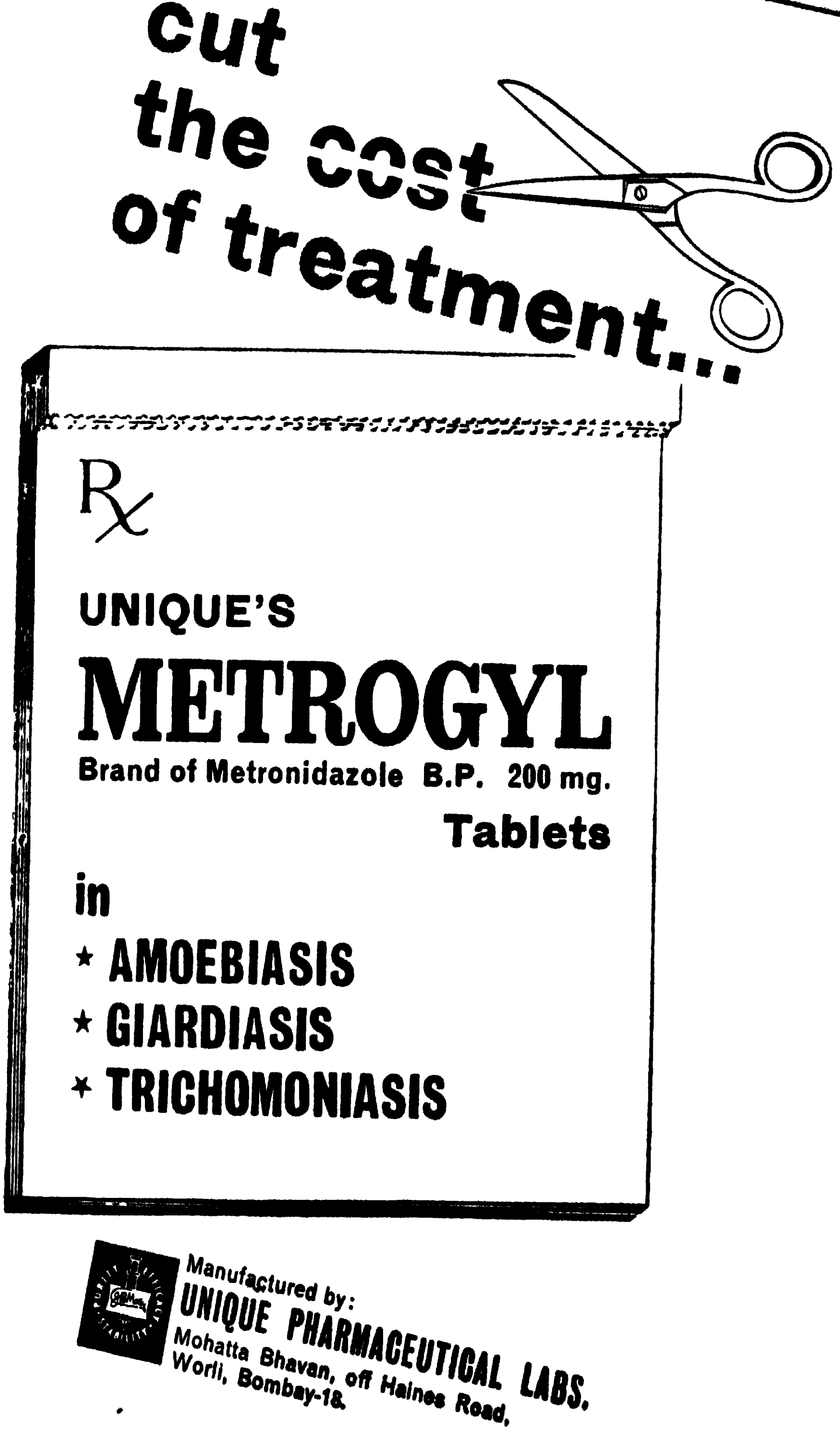

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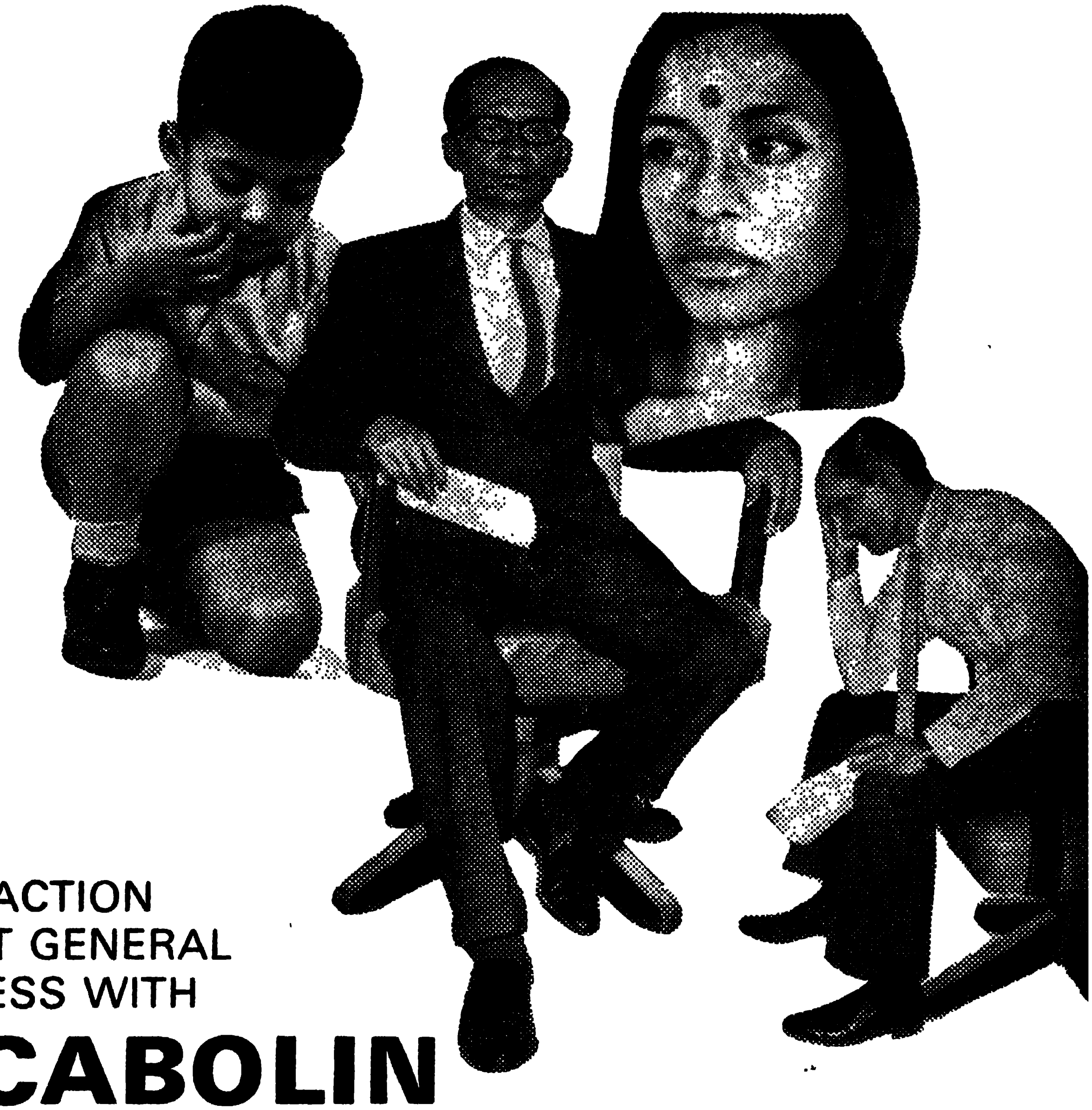

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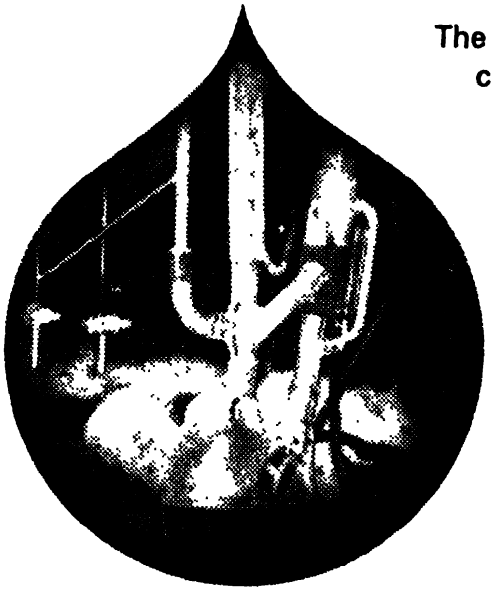

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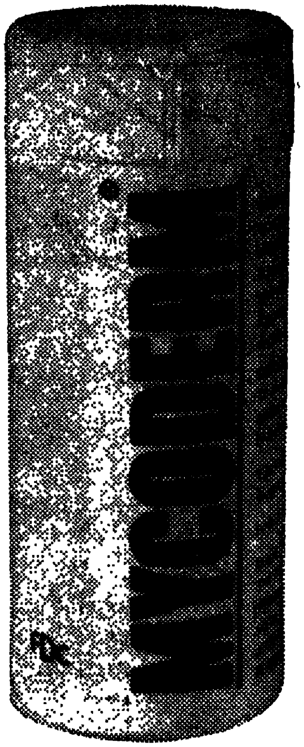

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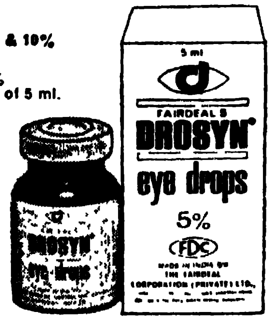

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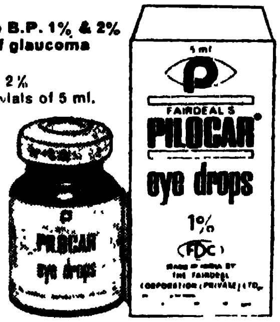

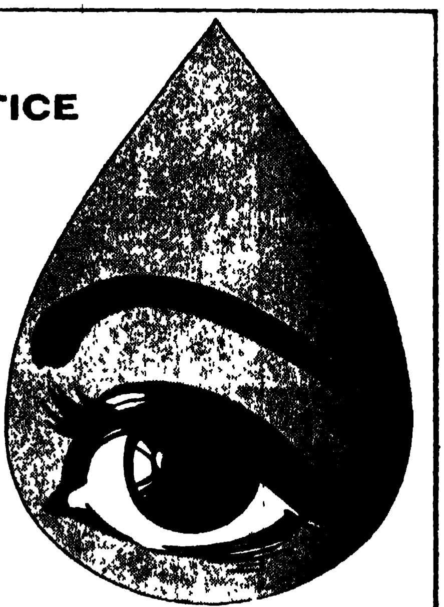

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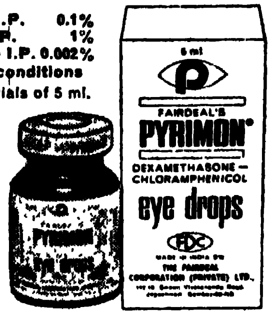

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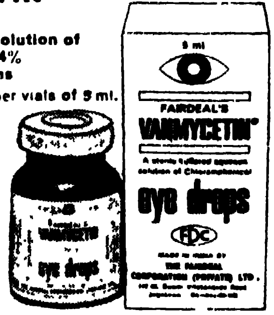

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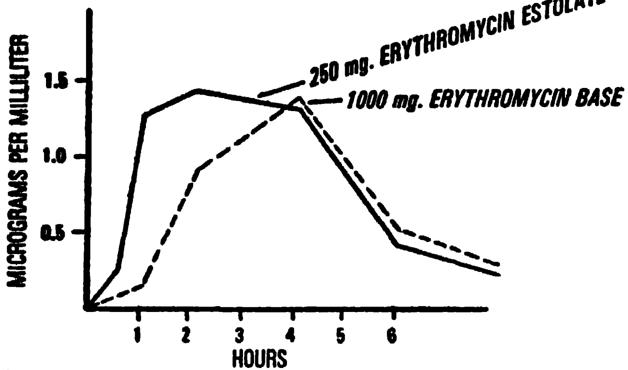

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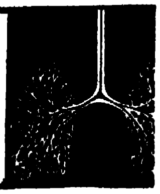

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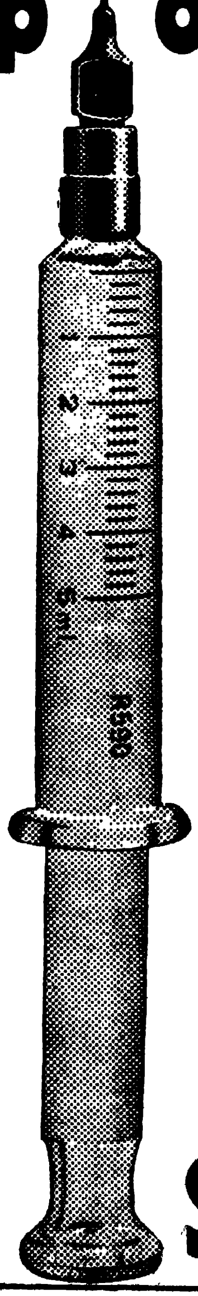

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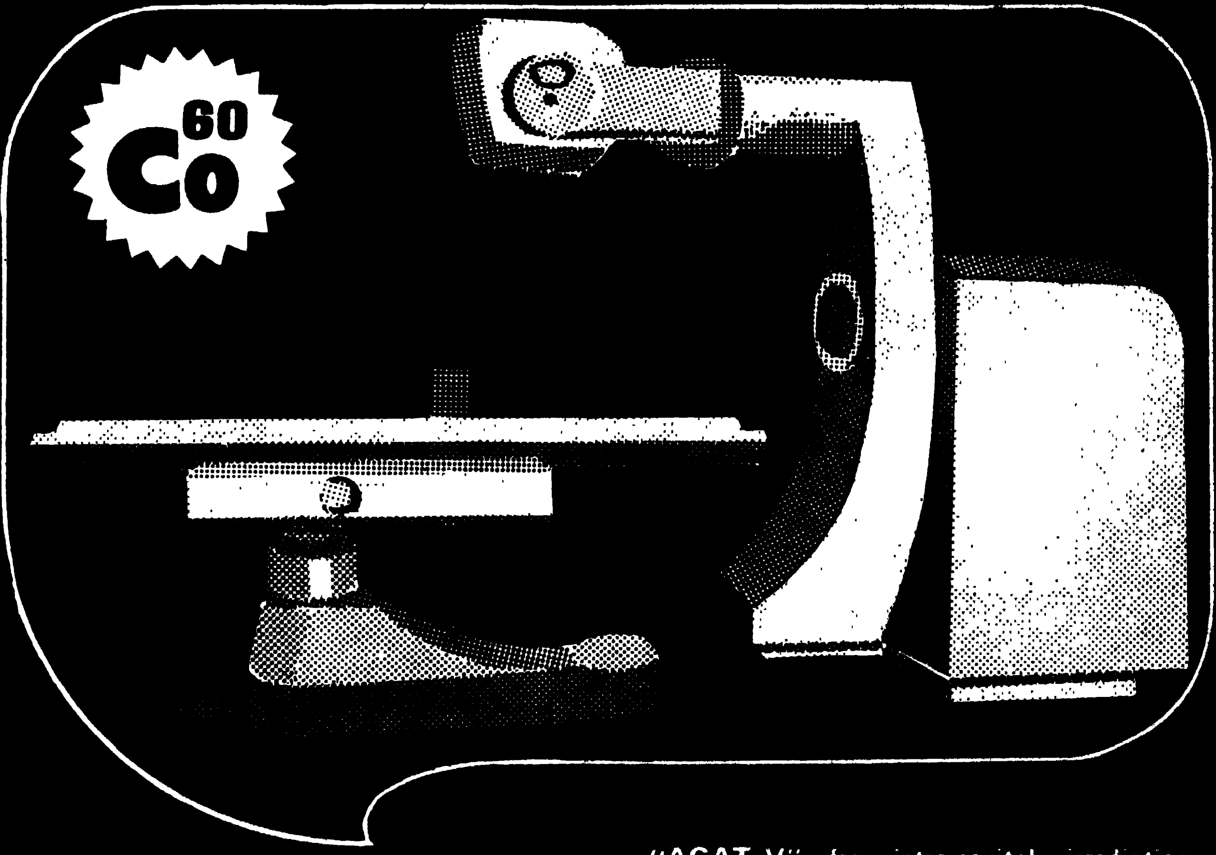

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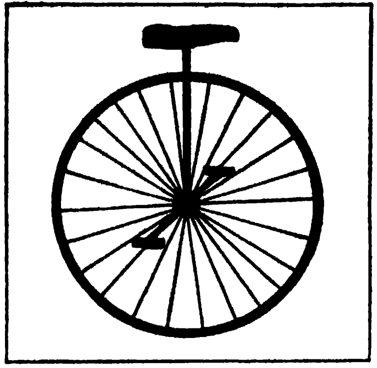

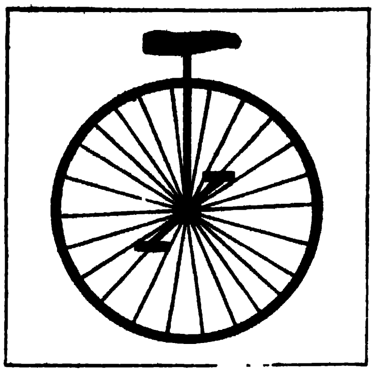

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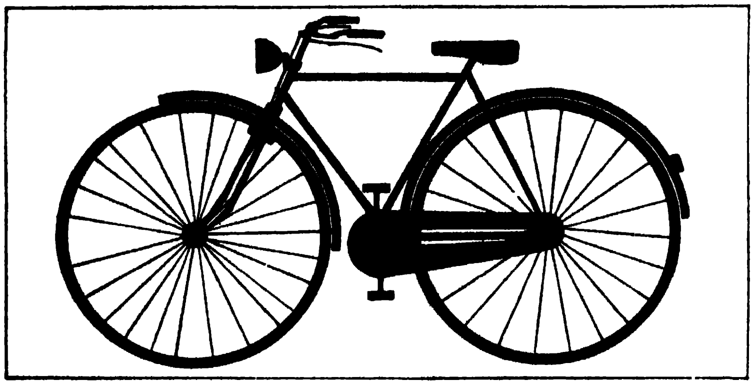

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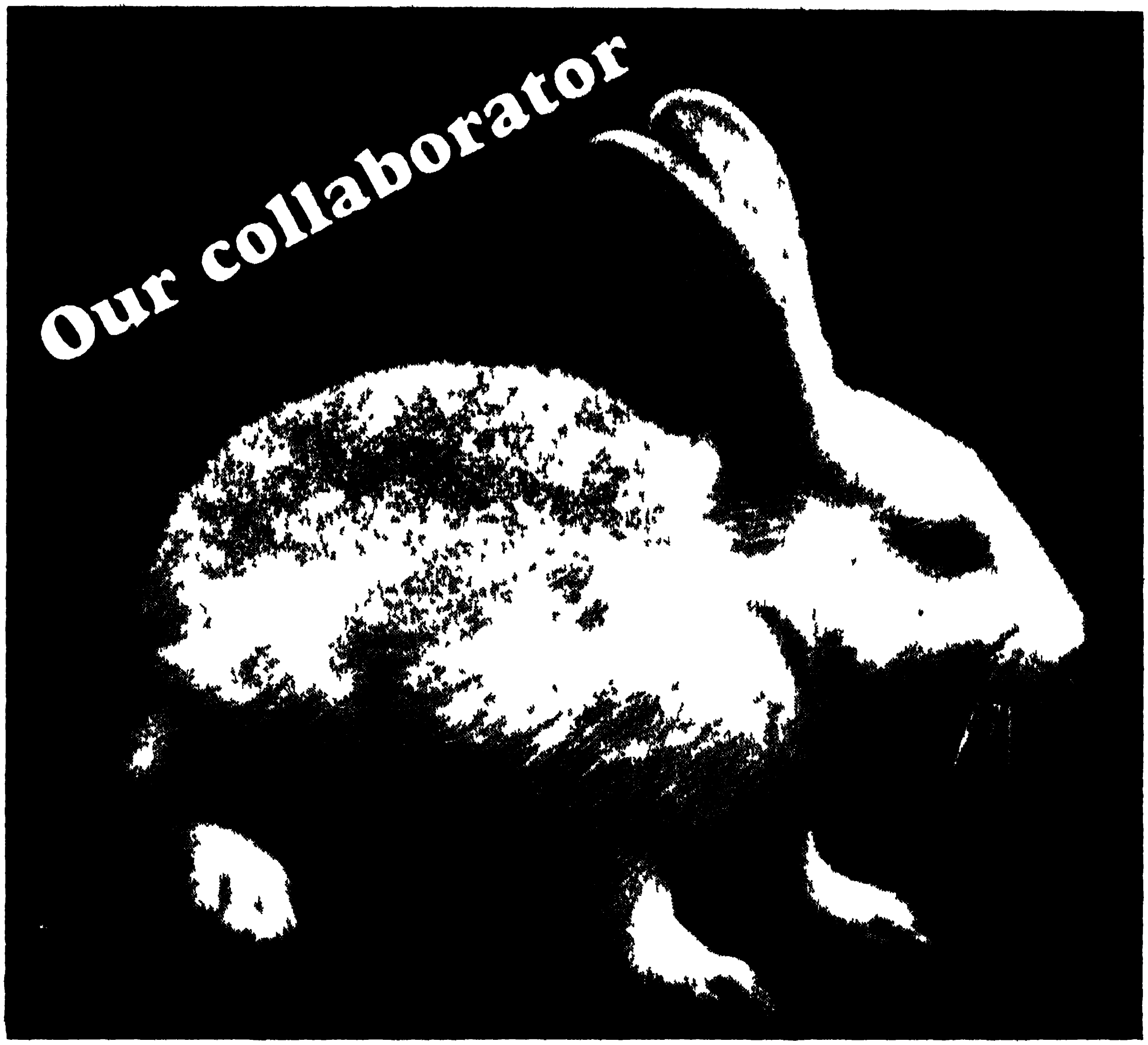

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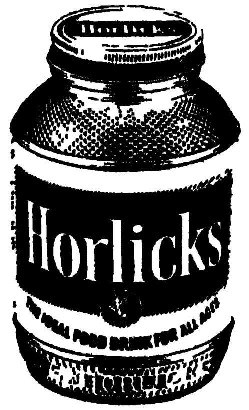

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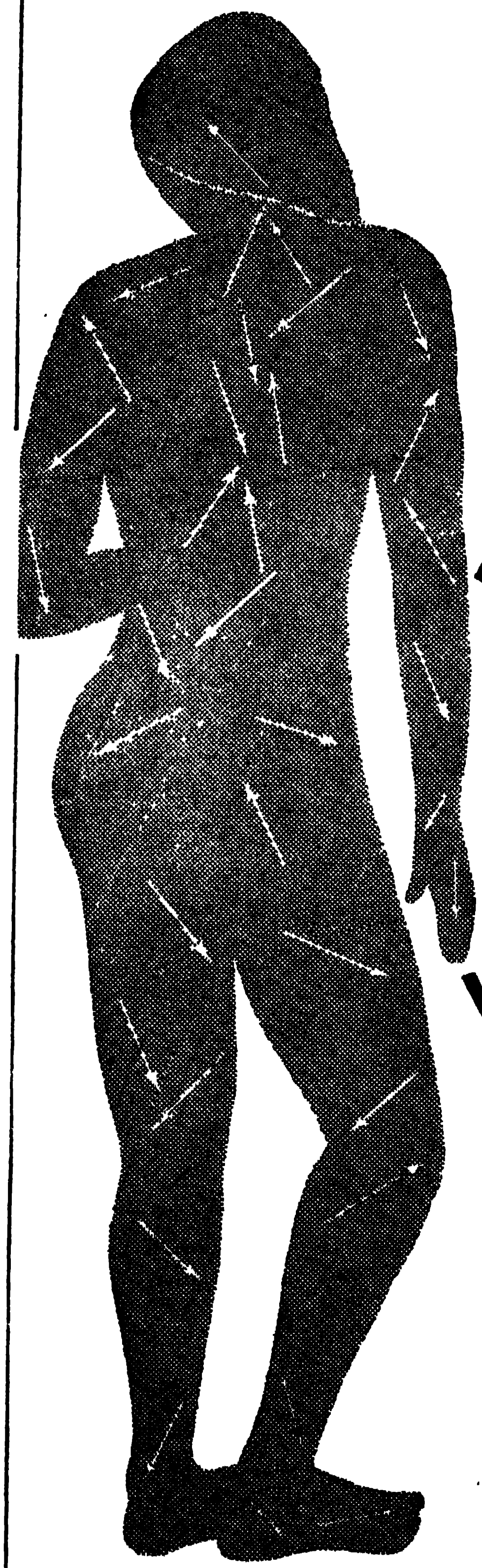

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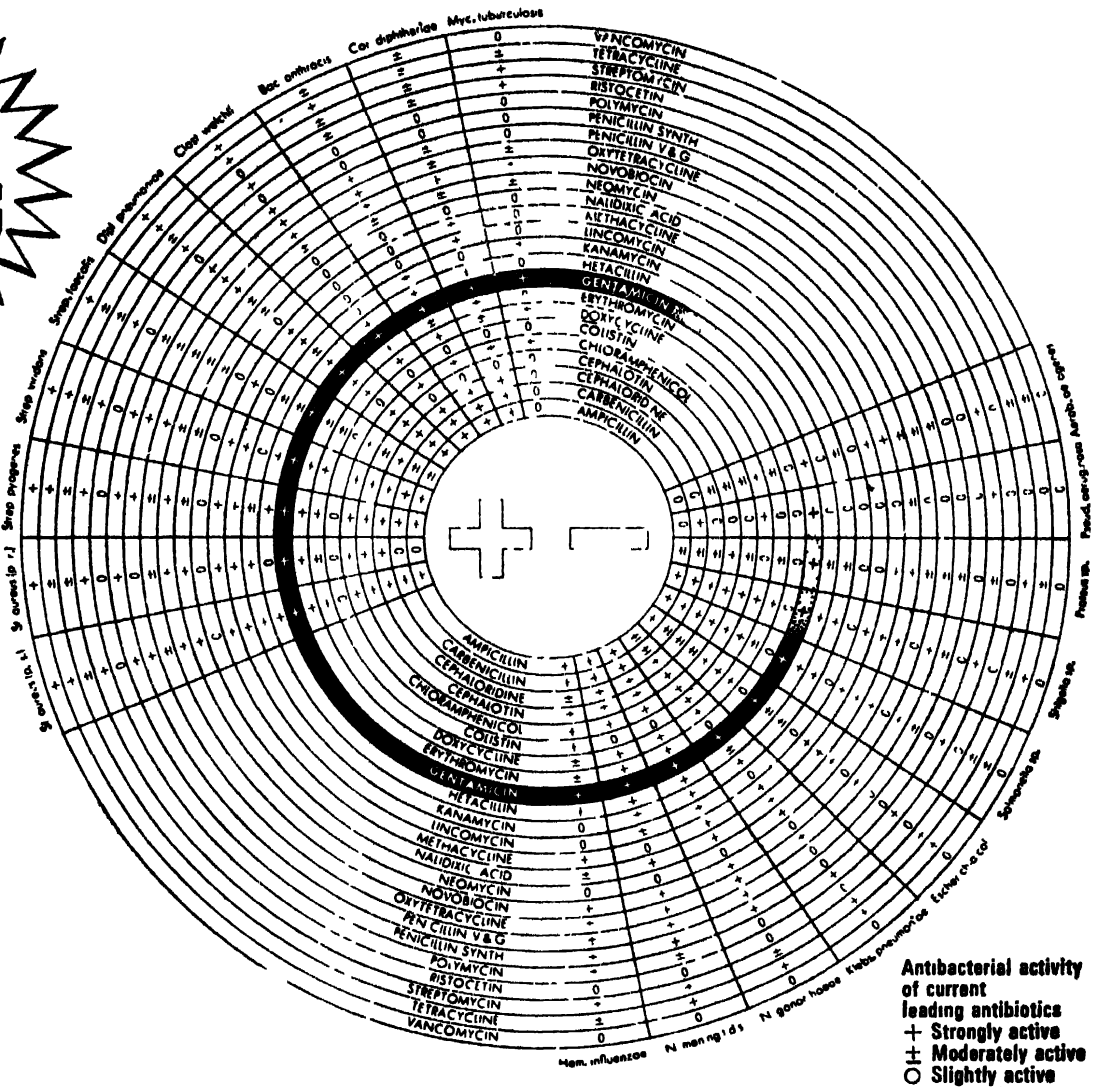

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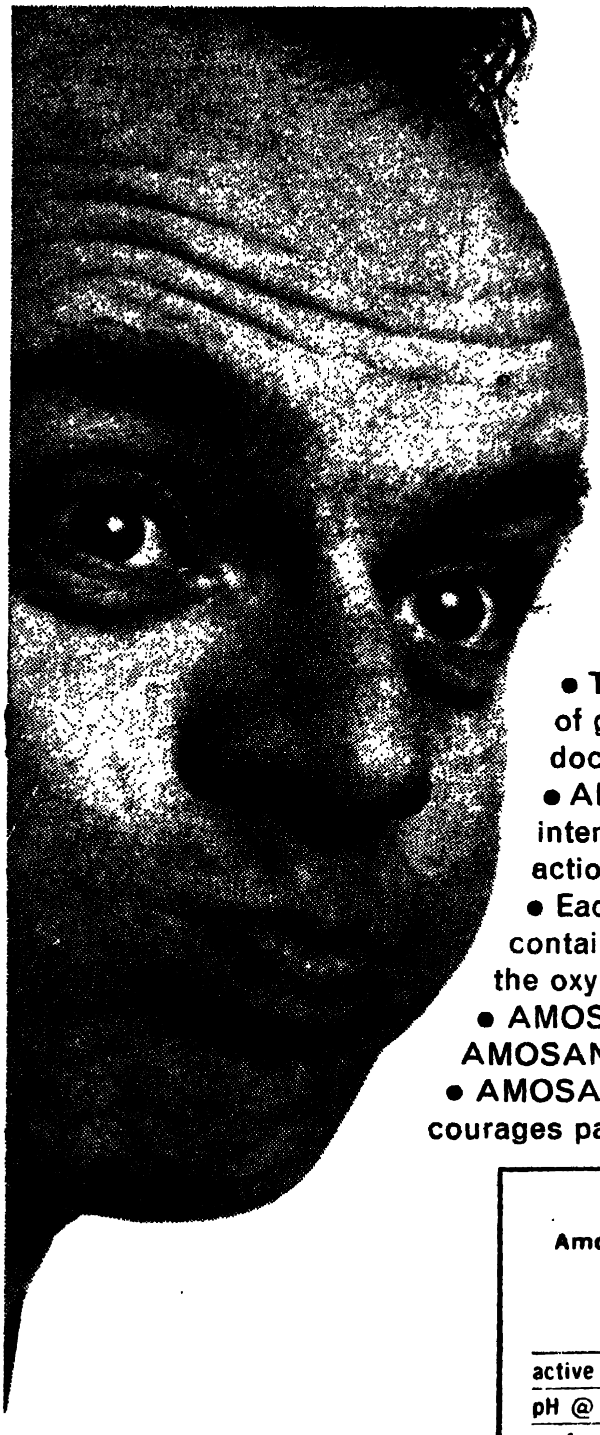

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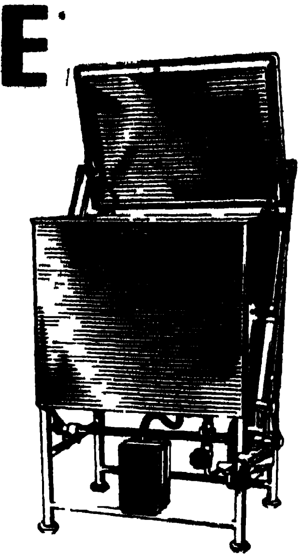

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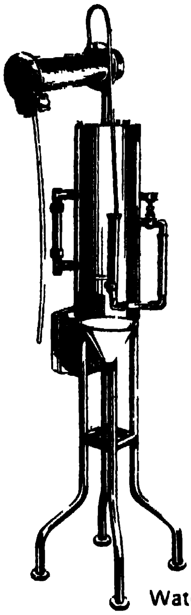

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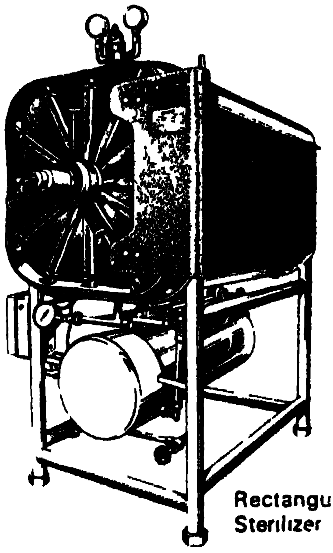

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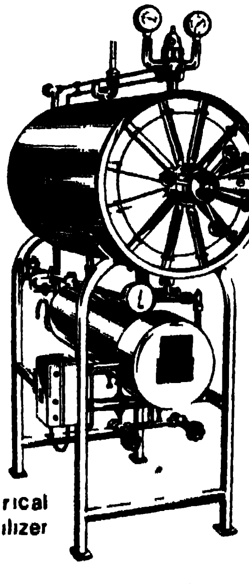

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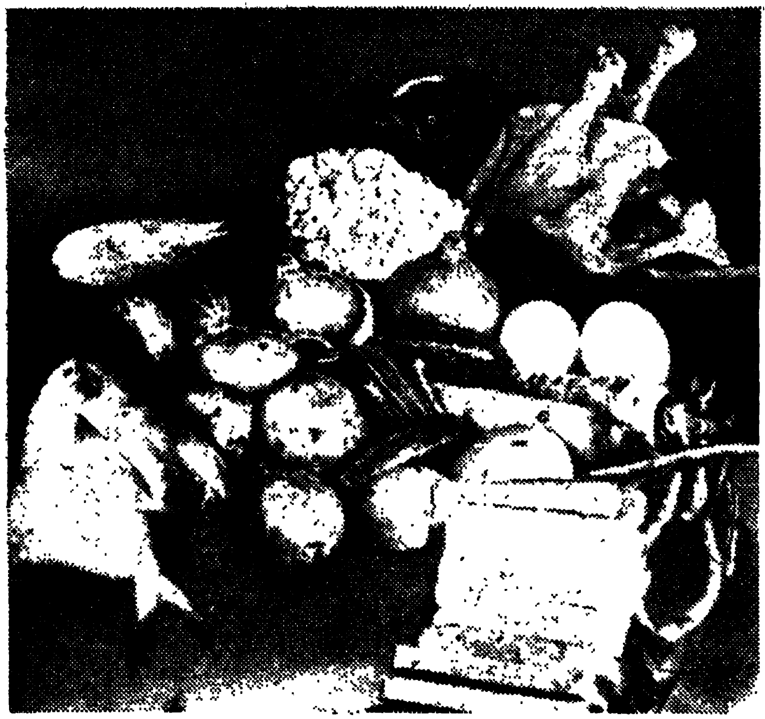

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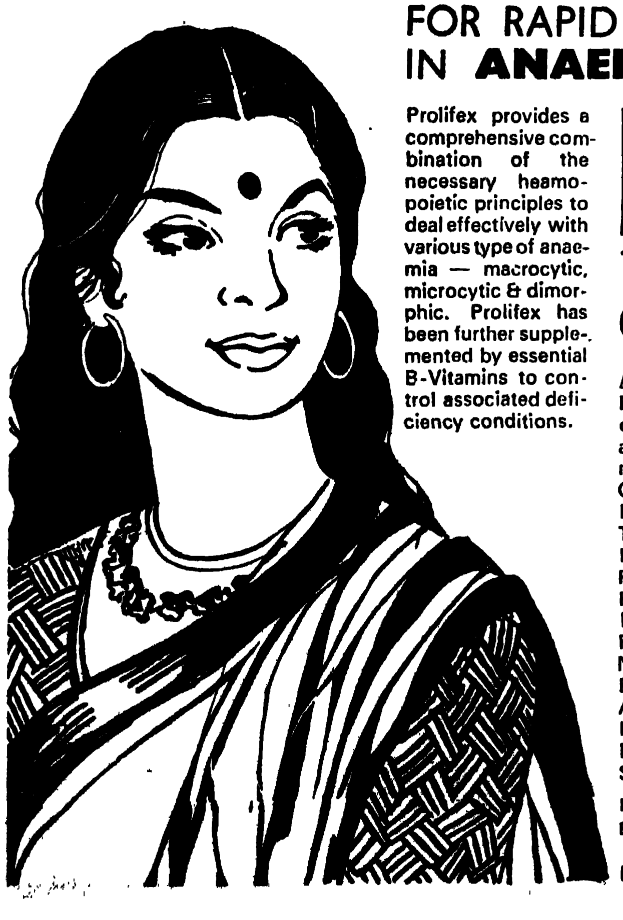

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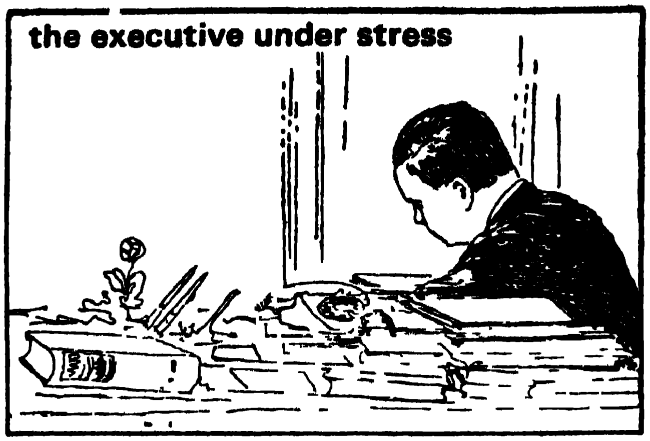

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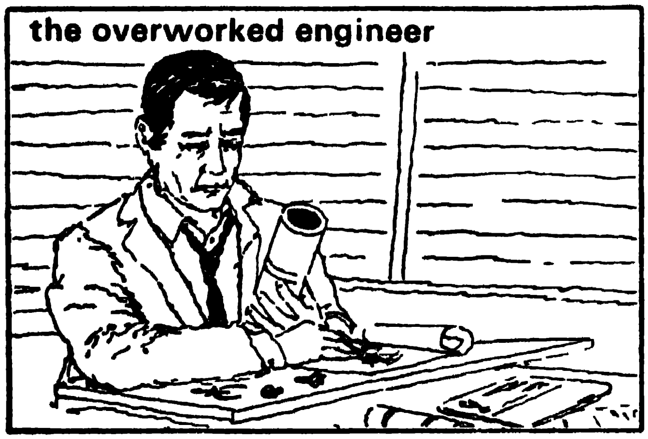

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ORIGINALS AND PAPERS

1

Heart and Muscular Dystrophy

SURENDRA MISRA*, B. C. KATIYAR**, P. N. SOMANI***

[*Received for publication June 2, 1972*]

The heredofamilial myopathic disorders showing cardiac involvement include progressive muscular dystrophy (Zatuchni *et al.*, 1951) and dystrophia myotonica (Conner, 1962). As early as 1883, Ross described myocardial atrophy in a 12-year-old male with 'pseudohypertrophic paralysis'. Subsequently, Globus (1923) reviewed the published meterial up to 1922 and suggested that pathological findings in the heart were in fact cardiac manifestations of skeletal muscular dystrophy. Earlier reports, however, drew attention to cardiac involvement only in Duchenne's muscular dystrophy (Berenbaum and Horowitz, 1956). During recent years, cardiovascular observations have been made in the Duchenne type (Manning and Cropp, 1958; Gilroy *et al.*, 1963; Welsh *et al.*, 1963; Perloff *et al.*, 1966), the limb girdle type (Welsh *et al.*, *loc. cit.*; Perloff *et al.*, *loc. cit.*), the facioscapulohumeral type (Welsh *et al.*, *loc. cit.*; Wahi, 1963; Prasad *et al.*, 1965; Perloff *et al.*, *loc. cit.*) and in the recently described benign X-linked muscular dystrophies of Mabry (Mabry *et al.*, 1965) and Emery and Dreifuss (1966) varieties. Although, dystrophic patients usually die due to inanition and infection, cardiac involvement itself may be an important cause of death (Weisenfeld and Messinger, 1952; Gilroy *et al.*, *loc. cit.*; Berenbaum and Horowitz, *loc. cit.*). The cardiac involvement in muscular dystrophy may manifest as clinical, radiological and/or electrocardiographic abnormalities.

The incidence of cardiac involvement in muscular dystrophy has varied from 25 to 85 per cent (Weisenfeld and Messinger, *loc. cit.*; Rubin and Buchberg, 1952; Walton and Nattrass, 1954). In a review extending over 30 years from 1922 to 1951 (Zatuchni *et al.*, *loc. cit.*), cardiac abnormalities were noted in 94 of the 292 dystrophic patients. In an earlier review of 480 cases up to 1904, Merlwin (1904, cited by Perloff *et al.*, *loc. cit.*) found cardiovascular abnormalities in 18 per cent.

Several such studies have been carried out on Indian patients and Table I summarises their relevant electrocardiographic data. The present study deals with clinical, radiological and electrocardiographic assessment of patients, carriers and unaffected brothers in families affected with muscular dystrophy.

MATERIAL AND METHOD

All patients attending the neurology clinic and medical outpatient of the University Hospital, and suffering from muscle disease were admitted and clinically evaluated on a pre-planned proforma. Special care was taken to exclude polymyositis by clinical and histopathological criteria. Besides clinical evaluation, cardiac assessment was carried out by postero-anterior chest films taken at 6 feet distance and by twelve

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Table 1—*Showing the Electrocardiographic Observations in Various Indian Studies*

	Prasad+ (1958)	Sarin and Dasgupta+ (1958)	Wahi+ (1963)	Prasad et al+ (1965)	Cherian et al** (1965)	Bhargava and Singh+ (1965)	Mehta *et al.*+ (1967)	Abraham *et al.*** (1967)
Total cases	2	1	60	28	96	10	3	96
Normal ECG	0	0	18	—	14	—	0	14
Small P wave	1	—	—	—	—	0	—	—
Prolonged P R interval	0	—	—	1	0	0	—	—
*Prolonged Q T interval	—	—	48	—	40	5	—	40
Sinus arrhythmia	1	1	—	—	0	6	—	—
Sinus tachycardia	—	—	30	7	—	1	—	—
Premature ventricular systoles	1	—	2	—	—	—	—	—
Right axis deviation	—	—	—	3	0	—	—	—
Left axis deviation	—	—	—	4	0	—	1	—
Low voltage	—	—	—	6	—	—	—	—
High voltage	—	—	—	5	—	—	—	—
*Abnormal Q waves	2	1	36	5	31	6	2	31
Prominent R waves	2	—	—	—	—	—	2	—
Tall QRS complexes	2	—	—	—	—	2	—	—
Widened QRS	—	—	—	—	1	0	—	—
Slurring of QRS	—	1	—	—	15	0	—	—
rSR pattern in V_1	—	—	7	—	—	1	—	—
Right ventricular hypertrophy	—	—	45	5	31	1	—	31
Left ventricular hypertrophy	—	—	21	6	53	2	3	53
Biventricular hypertrophy	—	—	—	4	—	—	—	24
Elevated S T segment	—	1	—	3	—	1	—	—
Depressed S T segment	—	1	—	5	—	1	—	—
*Abnormal T wave changes	1	1	12	4	17	4	—	—

*For brevity various sub-headings have been put under one heading.
**Authors classified their cases into pseudohypertrophic and limb girdle groups.
+The term pseudohypertrophic muscular dystrophy has been used without specifying whether the patients belonged to Duchenne or limb girdle group.

lead electrocardiogram recorded on a Siemens machine.

All patients of muscular dystrophy were classified according to Walton (1969). The female carriers of Duchenne's muscular dystrophy were divided into definite, probable and possible carriers based on the criterion of Thompson and Guest (1967).

Table 2 gives the details of our patients studied for cardiac assessment by various methods.

Table 2—*Showing the Details of Patients Studied*

Subjects studied	Clinically	Radiologically	Electrocardiographically
Muscular dystrophy	56	28	25
Duchenne carriers	15	11	10
Unaffected brothers	7	6	4

RESULTS

CLINICAL STATUS:

None except one of our patients showed any evidence of heart failure, cardiac enlargement or left ventricular failure. Various clinical abnormalities detected include sinus tachycardia, sinus arrhythmia and ventricular extrasystoles. These have been detailed under electrocardiographic abnormalities because of diagnostic preciseness.

The only patient who showed clinical evidence of heart disease suffered from Becker's benign X-linked muscular dystrophy. He had recurrent attacks of left and right sided heart failure, multiple extrasystoles and gross clinical congestive cardiomyopathy. The clinical, radiological and electrocardiographic status of this patient and that of his other affected brothers

Table 3—*Showing the Radiological Data in Muscular Dystrophy*

Radiological data	Duchenne	Limb girdle	Becker	Oculo-pharyn-geal	Congeni-tal	Scapulo-peroneal	Dystro-phia-myo-tonica
X-rays done	11	8	4	2	1	1	1
Altered cardiac contours	2	2	—	—	—	—	—
Prominent main pulmonary artery	—	1	—	—	—	—	—
Scoliosis	—	—	—	—	—	—	—
Elevated diaphragm	6	1	—	—	1	1	—
Cardiomegaly	—	—	1	—	—	—	—
Congenital fusion of first and second ribs on right side	—	1	—	—	—	—	—

suffering from Becker's benign X-linked muscular dystrophy is being reported elsewhere.

RADIOLOGICAL STATUS:

A. *Dystrophic patients*—Table 3 shows the radiological data in muscular dystrophy. Important abnormalities included elevated diaphragms and altered cardiac contours in Duchenne's muscular dystrophy, and altered cardiac contours, prominent main pulmonary artery, elevated diaphragms and congenital fusion of first and second ribs in limb girdle muscular dystrophy. One patient of congenital myopathy and another with scapuloperoneal muscular dystrophy also had elevated diaphragms. Cardiomegaly was present in a single patient who suffered from Becker's benign X-linked muscular dystrophy.

B. *Carriers and unaffected brothers*—To assess the significance of above findings in dystrophic patients, 6 of the 7 unaffected brothers of patients suffering from Duchenne type of muscular dystrophy and their female carriers were also examined (Table 4). It is noteworthy that elevated diaphragms were found in the carriers as well as in unaffected brothers. Besides, in one carrier there was questionable cardiomegaly. Other abnormalities in carriers were infrequent and included altered cardiac contours and scoliosis.

Table 4—*Showing Radiological Data in the Carriers and Unaffected Brothers of Patients of Duchenne's Muscular Dystrophy*

Radiological data	Carriers	Unaffected brothers
Total cases	15	7
X-rays done	11	6
Elevated diaphragm	5	4
Altered cardiac contours	1	—
Prominent main pulmonary artery	1	—
Scoliosis	2	—
Cardiomegaly	1	—

ELECTROCARDIOGRAPHIC DATA:

A. *Muscular dystrophy patients*—Electrocardiographic abnormalities were predominantly seen in Duchenne and limb girdle types of muscular dystrophy, although, minor abnormalities were present in other forms as well (Table 5).

In Duchenne type of muscular dystrophy, important electrocardiographic abnormalities included increased algebraic sum of R and S in V_1, abnormal R/S in V_1, rSr′ or RSr′ in $V_{5\text{-}6}$ and r′ in aVR. To find out the significance of increased algebraic sum of R-S in V_1, these values were checked in clinically normal controls. The control value was −4.8 ± 3.14 mm. Thus, if the algebraic sum of R and S was greater than the above control values, it was taken as abnormal.

In limb girdle type of muscular dystrophy widened QRS in L_3, aVL, aVF and $V_{1\text{-}5}$ was found in one case. Other changes were similar to those found in Duchenne type of muscular dystrophy but were less frequent.

B. *Unaffected brothers of patients with Duchenne's dystrophy*—Thable 6 shows the electrocardiographic abnormalities in the carriers and 4 unaffected brothers. Important abnormalities included increased algebraic sum of R and S in V_1, deep Q waves in $L_{2,3}$ and aVF, abnormal R/S in V_1, r′ in aVR and inverted T in $V_{1\text{-}3}$.

C. *Carriers of Duchenne's muscular dystrophy*—Out of the 15 female carriers, 10 were subjected to electrocardiography. 7 of these had increased algebraic sum of R and S in V_1. Other abnormalities included sinus arrhythmia in 2 cases, premature ventricular beats in 2, sinus tachycardia, left axis deviation and abnormal R/S in V_1 in one case each (Table 6).

Table 5—*Showing the Electrocardiographic Data in Muscular Dystrophy*

ECG data	Duchenne	Limb girdle	Facio-scapulo-humeral	Oculo-pharyn-geal	Scapulo-peroneal	Dystrophia myotonica	Becker
ECG done	11	6	1	1	1	1	4
Sinus arrhythmia	1	—	—	—	—	—	—
Sinus tachycardia	3	—	—	—	—	—	—
Right axis deviation	—	—	—	—	—	—	—
Left axis deviation	—	—	1	—	—	1	—
Ventricular extrasystoles	—	—	—	—	—	—	2
Deep Q waves:							
Lead I and aVL	2	—	—	—	—	—	—
Lead II, III and aVF	2	—	—	—	—	—	—
V_{4-5}	4	1	—	—	—	—	—
Widened QRS:							
L_{2-3} and V_{5-6}	—	—	—	—	—	1	—
L_3 aVL, aVF and V_{1-6}	—	1	—	—	—	—	—
Abnormal R/S in V_1	4	1	—	—	—	—	2
Increased algebraic sum of R and S in V_1	9	5	—	1	1	1	—
rSR′ or RSr′ in L_{2-3} and aVF	2	1	—	—	—	—	—
rSr′ or RSr′ in V_1	2	—	—	1	—	—	—
rSr′ or RSr′ in V_{5-6}	3	—	—	—	—	—	—
r′ in aVR	3	2	—	—	—	—	—
Inverted T wave:							
V_{1-2-3}	2	—	—	—	—	—	2
V_{1-2-3} and L_3	1	—	—	—	—	—	—
$V_{1-2-3-4}$ and L_3	1	—	—	—	—	—	—
V_{4-5-6}	—	1	—	—	—	—	1
Biphasic T in V_1	1	—	—	—	—	—	—
Elevated S T segment in L_3 and aVF	—	1	—	—	—	—	—

Table 6—*Showing Electrocardiographic Data in Carriers and Unaffected Brothers of Patients of Duchenne's Muscular Dystrophy*

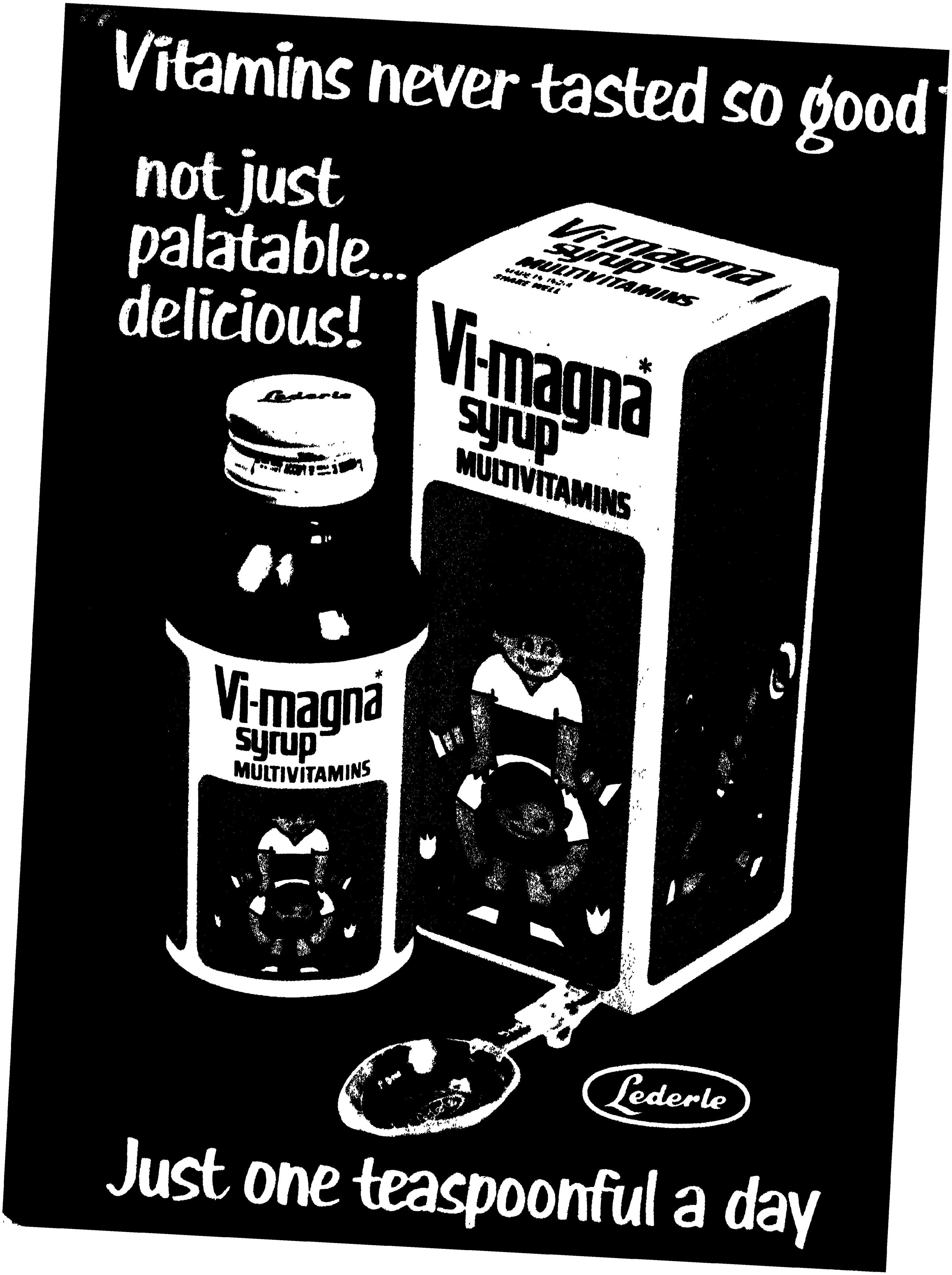
ECG data	Carriers	Unaffected brothers
Total cases	15	7
ECG done	10	4
High voltage	1	—
Left axis deviation	1	—
Sinus arrhythmia	2	1
Sinus tachycardia	1	—
Brachycardia	1	—
Premature ventricular beats	2	—
Deep Q wave in:		
L_{2-3} and aVF	—	2
V_{4-5}	—	1
Abnormal R/S in V_1	1	2
rSR′ in V_1	—	1
r′ in aVR		2
Increased algebraic sum of R-S in V_1	7	4
Inverted T in V_{1-2-3}	—	2

DISCUSSION

Results of our data are summarised in Table 7. Definitive clinical evidence of cardiac involvement lacked in all our patients except one who had congestive cardiomyopathy and suffered from mild form of Becker's benign X-linked muscular dystrophy. Published data relating cardiomyopathy to progressive muscular dystrophy are convincing but the importance of this relationship is not widely enough appre-

Table 7—*Showing the Incidence of Cardiac Involvement in Muscular Dystrophy*

Heart involvement	No. of patients studied	Abnormal findings	Percentage
Clinical	56	1	1.8
Radiological	28	14	50.0
ECG	25	22	88.0



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ciated (Perloff *et al., loc. cit.*). It is possible that occult cardic involvement often goes unrecognised. Published reports confirm myocardial involvement in muscular dystrophy with its incidence ranging from 25-85 per cent (Weisenfeld and Messinger, *loc. cit.;* Rubin and Buchberg, *loc. cit.;* Walton and Nattrass, *loc. cit.*). Clinical manifestations of heart disease include tachycardia, arrhythmias, murmurs, gallop rhythm, poor heart sounds, cardiomegaly. chest pain, cardiac failure and sudden death (Perloff, *et al., loc. cit.*). In reports from our country, these manifestations have not been emphasised (Prasad, 1958 ; Sarin and Dasgupta, 1958 ; Wahi, *loc. cit.* ; Prasad *et al.,* 1965 ; Cherian *et al.,* 1965 ; Bhargava and Singh, 1965 ; Mehta *et al.,* 1967 ; Abraham *et al.,* 1967). Although, some early studies drew attention to the cardiac involvement especially in the childhood type of muscular dystrophy (Berenbaum and Horowitz. *loc. cit.*), more recently, heart involvement has also been noted in limb girdle (Welsh *et al., loc. cit.*) and facioscapulohumeral dystrophy (Welsh *et al., loc. cit.*).

The radiological abnormalities were found in 50 per cent of our patients who were x-rayed. These abnormalities were seen irrespective of the type of muscular dystrophy. In this context, Perloff *et al.* (*loc. cit.*) commented that radiological interpretation of the size and configuration of heart must be considered in the context of the thoracic deformities and elevated diaphragms. Patients with pectus excavatum or with loss of normal thoracic kyphosis may have a left sided shift of the heart, a prominent pulmonary artery or a "pan cake" cardiac silhouette. Under these circumstances true cardiomegaly may be difficult to infer with certainity. In Perloff *et al.* (*loc. cit.*) series, although, cardiac contours were altered in 11 patients with Duchenne type, only in 2 confident diagnosis of intrinsic heart disease could be made.

The electrocardiographic abnormalities were observed in 88 per cent of our patients where ECGs were done. Perloff *et al.* (*loc. cit.*) also obtained abnormal electrocardiograms in their patients suffering from Duchenne's muscular dystrophy. These abnormalities have been thoroughly described by Rubin and Buchberg (*loc. cit.*), Weisenfeld and Messinger (*loc. cit.*), Perloff *et al.* (*loc. cit.*), Wahi (*loc. cit.*), Schott *et al.* (1955), Manning and Cropp (*loc. cit.*), Gilroy *et al.* (*loc. cit.*), Skyring and Mckusick (1961) and Welsh *et al.* (*loc. cit.*). It is notable that abnormalities of PR interval, arrhythmias and conduction defects are not frequent findings in the series of Indian workers (Table 1).

Female carriers of Duchenne type of muscular dystrophy show changes in serum enzymes, electromyography and histopathology that are similar to those found in patients with muscular dystrophy (Emery, 1963 ; Walton, *loc. cit.*). With this in view, it was thought worthwhile to assess radiological and electrocardiographic changes in the carriers. In our series the significance of radiological abnormalities in carrier detection needs further substantiation by studying larger number of carriers. The electrocardiographic abnormalities in the carriers of Duchenne type of muscular dystrophy include increased algebraic sum of R and S in lead V_1, occasional ventricular extrasystoles, inverted and low voltage T waves in V_{2-6} and abnormally tall R in right precordial leads (Emery, 1969 ; Hausmanowa-Petrusewicz *et al.,* 1966). The present study confirms the finding of Emery (1969) that algebraic sum of R-S in V_1 is an important abnormality likely to help in carrier-detection.

Preclinical or subclinical muscular dystrophy can be detected in clinically normal brothers by means of serum enzyme estimations, electromyography and muscle histopathology (Smith *et al.,* 1966). It was thought probable that such patients may exhibt radiological or electrocardiographic evidence of muscular dystrophy. Our results suggest that electrocardiography may lead to increased detection of subclinical muscular dystrophy but this needs substantiation by a larger series.

SUMMARY

The present study deals with clinical, radiological and electrocardiographic assessment of patients, carriers and unaffected brothers in families affected with muscular dystrophy. Electrocardiographic abnormalities are common in patients, their carriers and unaffected brothers. It is hoped that with the study of a larger number of carriers and unaffected brothers the role of electrocardiography may emerge as a simple test with high rate of accuracy in the detection of preclinical muscular dystrophy and the carrier state.

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2

Meckel's Diverticulum Causing Intestinal Obstruction

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[Received for publication April 4, 1972]

Meckel's diverticulum is a well known congenital abnormality of small bowel, frequently suspected, often looked for and seldom found (Mayo, 1933). Johann Friedrich Meckel in 1807 first of all presented the embryology and pathology of Meckel's diverticulum and since then, it is known after his name. It occurs in 2-4 per cent of people with male : female preponderance of approximately 3 : 2. The reported incidence in laparotomy series is probably lower because a routine and careful search is not always made. Goodman (quoted by Mukherjee, 1969) reported an incidence of 0.24 per cent. Where a systemic search was made, the incidence varied from 1.3 per cent to 4.5 per cent (Harbin, 1930; Rosenfeld, 1955).

There are only a few reports in Indian literature on Meckel's diverticulum causing intestinal obstruction (Taneja and Eggleston, 1964 : Mehdiratta *et al.*, 1969 ; Mukherjee, 1969 ; Srivastava, 1971). Meckel's diverticulum presenting as intestinal obstruction is an uncommon cause and scarcity and paucity of Indian literature stimulated the authors to present this paper.

MATERIAL AND METHOD

The material comprises 11 cases, admitted to Associated Group of Hospital's, Bikaner between January 1968 and January 1972, as of acute intestinal obstruction and were treated as an emergency.

OBSERVATIONS

All cases presented as acute abdomen and duration of symptoms was more than three days with an average of about four and a half days. Pain was the first symptom in all cases. Vomiting was recorded in 10 cases but was a late symptom. None had vomiting in first 48 hours of the onset of illness. The symptomatology recorded is shown in Table 1.

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Table 1—*Showing Clinical Features*

Symptoms and signs	No. of cases
Pain abdomen	11
Vomiting	10
Distension	8
Absolute constipation	7
Blood in stool	2
Muscle guard	6
Lump abdomen	3
Discharging sinus umbilicus	1

Table 2—*Showing Cause, Surgical Procedure, Pathology and Complications*

Cause of obstruction	Surgical procedure	Pathology	Size of Meckel's diverticulum	Morbidity	Mortality
1. *Intussusception*					
a) Adult, H.F., 40 years	Resection and ileo-transverse colostomy	Gangrene	2″	Postoperative ileus	Nil
b) Child, HM., 11 years	Resection and ileo-ascending colon anastomosis	Gangrene with peritonitis	1½″	Pulmonary infection	Nil
c) Infant, H.M., 11 months	Resection and ileo-ileal anastomosis	No gangrene	1″	Ileus and electrolyte imbalance	Expired
2. *Volvulus*					
a) Adult, H.M., 27 years	Volvulus undone and diverticulectomy	No gangrene (Tip fixed to navel)	2½″	Cardiac arrest resuscitated	Cardiac arrest on the table and died on 2nd day
b) Child, M.M., 8 years	—do—	—do—	2″	Respiratory infection	Nil
c) Child, H.F., 8 years	Volvulus undone and resection of Meckel's diverticulum	No gangrene	4″	Discharging sinus umbilicus	Nil
3. *Acute Kinking* Adult, H.M., 28 years	Local resection	No gangrene (Tip fixed below navel)	1¾″	Wound sepsis	Nil
4. *Adhesions to right iliac fossa with tip of Meckel's diverticulum*					
a) Adult, H.M., 32 years	Adhesiotomy and local resection and end to end anastomosis	No gangrene; band from tip of diverticulum attached to right iliac fossa	3″	Pelvic abscess	Nil
b) Child, H.F., 12 years	Adhesiotomy and diverticulectomy	No gangrene	3″	Nil	Nil
5. *Inflammation* Adult, H.M., 25 years	Local resection and end to end anastomosis	No gangrene; inflammation in adjoining areas	½″	Nil	Nil
6. *Lump due to adhesion of omentum and intestines* Adult, H.M., 30 years	Adhesions separated and resection of Meckel's diverticulum	Meckel's diverticulum attached to mesentry and it was arising from side of gut wall	5″ broad; 1 base with mesentry	Nil	Nil

The Meckel's diverticulum caused intestinal obstruction in various ways, such as—intussusception, volvulus, adhesions, etc. (Table 2). Various surgical procedure to deal with the condition, pathology, size of diverticulum, morbidity and mortality have also been shown in Table 2.

Average age of patients was about 20 years, i.e., higher than normally expected. Male to female ratio was 8 : 3. Mortality rate was 18 per cent.

DISCUSSION

Meckel's diverticulum is not a common cause of intestinal obstruction. The incidence of intestinal obstruction caused by Meckel's diverticulum in Indian literature varies from 0.9 per cent to 3.3 per cent (Taneja and Eggleston, *loc. cit.*; Kochar *et al.*, 1966 ; Bhansali and Sethna, 1970 ; Sran *et al.*, 1970). The first case was reported by Van Doeveren and Sandifort (quoted by Mukherjee, *loc. cit.*) in 1793. It can cause obstruction in various ways like intussusception, volvulus, kinking, adhesions, band formation and/or by tying a knot around small intestine (Walsh, 1950 ; Dorling, 1951). In the present study, intussusception and volvulus (55 per cent) were the main causes.

From papers of Bird (1943), Moses (1947), Brooks (1954), Soderlund (1959), Dowse (1961), Rutherford and Akers (1966) and Kremer and Martin (1968), it would appear that approximately 15.35 per cent of Meckel's diverticulum give rise to symptoms and undergo pathological changes. Of these morbid diverticula 50 per cent present before the patient reaches the age of 2 years and result in mortality rate upto 21 per cent. In the present study average age of presenting as obstruction was 20 years, thus suggesting that obstruction was a feature of adult age Mortality rate in the present series was 18 per cent, but much lower mortality rate in morbid Meckel's diverticula has been reported by Taneja and Eggleston (*loc. cit.*)—2 per cent and Mehdiratta *et al.* (*loc. cit.*) —4 per cent.

Pre-operative diagnosis is extremely difficult as the symptomatology of intestinal obstruction due to Meckel's diverticulum, does not differ very much from that of the usual type of low small bowel obstruction. History of frequent attacks of mild colicky pain abdomen is suggestive. Vomiting is not a dominant feature. Though vomiting was present in ten cases out of eleven but was a late feature. In six cases vomiting started after third day of onset of symptoms. The average duration of presenting for treatment to hospital was 4.5 days. The reason for late presentation may be delayed onset of vomiting, probably due to incomplete obstruction in the beginning.

Meckel's diverticulum is a remanant of vitello intestinal duct, found in 2 per cent of cases, two inches long and about two feet proximal to ileocaecal junction as mentioned in the standard textbooks. There are reports in which it has been found to be situated 66 inches proximal (Jay *et al.*, 1960) ; 5 to 6 feet proximal (Meyerwitz, 1958) and 3 to 5 feet proximal to ileocaecal junction (Rowlinson. 1956) and in the present series the situation of the diverticula were from 20 to 36 inches proximal to ileocaecal junction. From above facts, it is clear that one should not feel satisfied by mere exploring two feet of small intestine but a thorough search must be made.

A case of Meckel's diverticulitis is more dangerous than appendicitis as the perforation is much earlier due to thinner wall and localisation is much less. There was not even a single case of perforation, though the cases presented fairly late for treatment. It is agreed that many people with Meckel's diverticulum live a normal healthy life There can be no doubt that with the onset of complication life is in jeopardy Since the intestinal obstruction due to Meckel's diverticulum has been observed mainly in adults, therefore it is emphasised that Meckel's diverticulum, found incidentally on routine laparotomy or appendicectomy, must be removed particularly when their size is bigger.

SUMMARY

Eleven cases of Meckel's diverticulum causing intestinal obstruction in various ways has been recorded. The clinical picture is similar to low small bowel obstruction with delayed onset of vomiting. Average age was 20 years which is much higher than usual. Mortality rate was 18 per cent. The need for removal of Meckel's diverticulum found incidentally has been emphasised.

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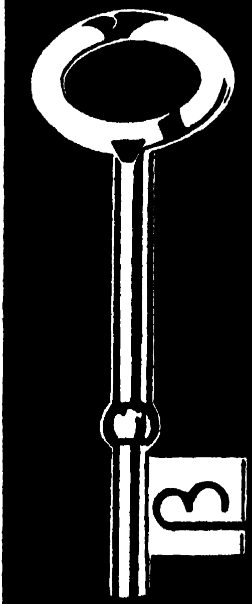

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3

Genetic Intercorrelation Between Finger-Ball Patterns and Blood Groups

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During the past century it has been apparent that different populations reveal wide variations in the frequency of papillary patterns on the finger-balls and also wide variations in blood groups. These two characters also usefully employed for the study of ethnic variations, genetics and human biology. Not much work, however, has been done in this direction. That is why such an intercorrelative study between dermatoglyphics and blood groups has been tackled in this present paper so as to reveal the genetic interdependence and the differential effect of their independent courses of evolutionary specialisation.

MATERIAL AND METHOD

According to the methods described by Cummins and Midlo (1943) the bilateral finger prints of 688 unrelated adult males were collected among whom persons belonging to blood groups O, B, A, and AB were 260, 264, 132 and 32 in number respectively.

The subjects under study mainly comprised the donors at Blood Bank, the indoor patients, doctors, house staffs and medical students of M.K.C.G. Medical College Hospital. Thus, the persons under study sporadically represent different casts, religion and regions as well.

Blood grouping was done by standard Anti-A and Anti-B group sera whereas the finger print patterns were identified according to Galton's three-fold formulae.

OBSERVATIONS

Here the incidence of different patterns like whorl, loop, arch, etc., were studied in connection with various blood groups and different fingers and the results have been tabulated in Tables 1, 2, 3 and 4. Table 1 shows the distribution of papillary patterns, Table 2 shows the comparative incidence of whorl and loop in different digits. Table 3 shows the percentage of papillary patterns and indices and Table 4 shows the frequency of ridge patterns on finger tips.

CONCLUSION

From the above observations (Tables 1, 2, 3, 4) we can safely conclude that the number of whorl occurs more than the loop in I finger of all groups, I and IV fingers of persons with groups 'O', 'B', 'A'. The highest percentage of whorls occurs in I (53.125) and II (53.125) fingers of AB group whereas in IV (O—59.23, B—58.37, A—55.325) finger of all other groups. The III finger of all groups possess the lowest number of whorls (A—26.52, B—25.375, O—26.59, AB—25.00).

The percentage of loop is more than whorl in III finger of all groups and II, III, V fingers of group 'O', 'B' and 'A' persons. The commonest occurrence of loop happens to be in V (AB—71.88, O—72.31, A—68.94) finger of 'AB', 'O' and

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Table 1—*Showing Distribution of Papillary Patterns*

Patterns		I	II	III	IV	V
'AB' Group (32 males)						
Whorl No. (%)	Right	18 (56.25)	16 (50.00)	10 (31.25)	16 (50.00)	10 (31.25)
	Left	16 (50.00)	18 (56.25)	6 (18.75)	12 (57.50)	8 (25.00)
Loop No. (%)	Right	14 (43.75)	14 (43.75)	22 (68.75)	16 (50.00)	22 (68.75)
(Ulnar+Radial)	Left	14 (43.75)	12 (37.50)	22 (68.75)	20 (62.50)	24 (75.00)
Arch No. (%)	Right	x	2 (6.25)	x	x	x
	Left	2 (6.25)	2 (6.25)	4 (12.50)	x	x
'O' Group (260 males)						
Whorl No. (%)	Right	136 (52.30)	108 (41.54)	56 (21.54)	168 (64.62)	80 (30.77)
	Left	134 (51.54)	106 (40.78)	82 (31.64)	140 (53.84)	58 (22.30)
Loop No. (%)	Right	122 (46.93)	140 (53.84)	204 (78.46)	90 (34.61)	176 (67.69)
(Ulnar+Radial)	Left	120 (46.16)	140 (53.84)	172 (66.06)	120 (46.16)	200 (76.93)
Arch No. (%)	Right	2 (0.77)	12 (4.62)	x	2 (0.77)	4 (1.54)
	Left	6 (2.30)	14 (5.38)	6 (2.30)	x	2 (0.77)
'B' Group (264 males)						
Whorl No. (%)	Right	132 (50.00)	110 (41.67)	72 (27.27)	148 (56.06)	88 (33.34)
	Left	130 (49.28)	104 (39.39)	62 (23.48)	160 (60.68)	64 (24.24)
Loop No. (%)	Right	126 (47.76)	138 (52.27)	184 (69.76)	112 (42.50)	172 (55.22)
(Ulnar+Radial)	Left	128 (48.48)	136 (51.65)	192 (72.74)	100 (37.88)	198 (75.04)
Arch No. (%)	Right	6 (2.24)	16 (6.06)	8 (3.03)	4 (1.44)	4 (1.44)
	Left	6 (2.24)	24 (8.96)	10 (3.78)	4 (1.44)	2 (0.72)
'A' Group (132 males)						
Whorl No. (%)	Right	68 (51.51)	48 (36.37)	36 (27.28)	68 (51.51)	38 (28.78)
	Left	66 (49.94)	44 (33.44)	34 (25.76)	78 (59.14)	36 (27.28)
Loop No. (%)	Right	62 (46.97)	72 (54 54)	90 (68.18)	60 (45.45)	94 (71.22)
(Ulnar+Radial)	Left	64 (48.54)	76 (57.47)	92 (69.70)	54 (40.86)	96 (72.72)
Arch No. (%)	Right	2 (1.52)	12 (9.09)	6 (4.54)	4 (3.04)	x
	Left	2 (1.52)	12 (9.09)	6 (4.54)	x	x

Table 2—*Showing Comparative Incidence of Whorl and Loop (Radial and Ulnar) in Different Digits*

Digit	Right	Left	Right and Left combination	Whorl : Loop
Group 'AB'				
I	W > L	W > L	W > L	1 : 1.21
II	W > L	W > L	W > L	1 : 1.61
III	L > W	L > W	L > W	1 : 2.75
IV	L = W	L > W	L > W	1 : 1.28
V	L > W	L > W	L > W	1 : 2.55
Group 'O'				
I	W > L	W > L	W > L	1 : 1.12
II	L > W	L > W	L > W	1 : 1.30
III	L > W	L > W	L > W	1 : 2.72
IV	W > L	W > L	W > L	1 : 1.46
V	L > W	L > W	L > W	1 : 2.72
Group 'B'				
I	W > L	W > L	W > L	1 : 1.03
II	L > W	L > W	L > W	1 : 1.28
III	L > W	L > W	L > W	1 : 2.80
IV	W > L	W > L	W > L	1 : 1.45
V	L > W	L > W	L > W	1 : 2.26
Group 'A'				
I	W > L	W > L	W > L	1 : 1.06
II	L > W	L > W	L > W	1 : 1.60
III	L > W	L > W	L > W	1 : 2.58
IV	W > L	W > L	W > L	1 : 1.27
V	L > W	L > W	L > W	1 : 2.56

'A' group persons and III finger (O—72.31, B—71.77) of 'O' and 'B' group individuals. The percentage of loop is lowest in IV finger (A—48.16, B—40.19, O—40.38) of all groups except 'AB' group where II finger (40.625) is at the bottom

The number of radial loop on the left side is more in 'B', 'A', 'O' group persons whereas in 'AB' group it is equally distributed. The occurrence of radial loop is more in finger II in all groups of persons. Arch is more on the right side of 'A' group, whereas they are more on left side in the rest of blood groups. The blood groups 'A', 'B', 'O' contain more arch in II finger of both hands, but that is not so in 'AB' group.

The mean W/L ratio for various blood groups have been calculated from Table 2 and are arranged in ascending order, like B (1.764), A (1.814), O (1.864) and AB (1.88).

Table 3—*Showing Percentage of Papillary Patterns and Indices*

Blood groups	Sex	No. of cases	Whorl (%)	Loop (%)	Arch	Pattern intensity index	Arch : whorl index	Whorl : Loop index
AB	Male	32	40.63	56.25	3.12	11.75	7.67	72.23
O	Male	260	41.08	57.08	1.84	13.92	4.47	71.96
B	Male	264	40.52	56.30	3.18	13.73	7.84	71.97
A	Male	132	39.09	57.57	3.34	13.57	8.54	67.89

Note: Pattern intensity index— $\dfrac{2 \times \% \text{ Whorls} + 1 \times \% \text{ Loops}}{10}$

Dankmeijer index (A/W Index) $\dfrac{\% \text{ Arches}}{\% \text{ Whorls}} \times 100$

Furuhata Index (W/L index) $\dfrac{\% \text{ Whorls}}{\% \text{ Loops}} \times 100$

Table 4—*Showing Frequency of Ridge Patterns on Finger Tips of Some Populations*

Sex	Pattern types W	L	A	Total No. of fingers	
Male	40	57	3	9300	(Mukherjee and Saha, 1970)
Female	37	60	3	4100	(Present study, 1971)
Ungrouped	40.33	61.80	2.87	6880	(Present study, 1971) Pooled blood groups

Table 3 shows the different patterns among the various blood groups along with the different indices. The group 'O' shows the highest (13.92) pattern intensity index, 'AB' group shows the lowest (11.75). As regards the arch/whorl index, 'A' group possesses the highest (8.54) and 'O' group the lowest (4.47) percentage. The highest value of whorl/loop index is found in 'AB' group (72.23) while the least is possessed by 'A' blood group (67.89) individuals.

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4

Sports Traumatology Syndrome†

ALOKE GHOSH*

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Injury to a sportsman is a baffling and a frightening experience which is likely to produce a "mental trauma" remaining as a scar on the mind indefinitely, thus limiting his future performances. He may suffer from a premonition of further trauma, i.e., anticipation of dangers ahead whether real or imaginary. The participant is involved in the so-called phobia or "illness of trauma". There may be fear, injury to pride, failing morale, anxiety about involving others besides himself and a sense of failure. Considering all these factors, the sports injuries may also be brought into sickness or illness category, i.e., "the injury syndrome in sports". Since sports is a mass participation affair the aetiology of these syndrome needs proper assessment and investigation from various angles remembering the diversity of innumerable events. Assuming that diagnosis and treatment of injuries in modern times is adequate and will remain so, or even will be improved upon in hitherto unknown fields, the investigations by a team of Sports Medical Experts would need to reach the causes of various injuries. The first-aid techniques, quick resuscitation measures beyond conventional safety measures in various sporting events are necessary.

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Injury investigation teams need to be formed to collect information from a number of injuries selected randomly of specified sports and also unspecified causes including human, mechanical, natural or environmental factors, with proper follow-up studies of injured participants. Here proper reporting and reviewing are essential.

The modern fast sporting events have increasingly exposed the competitors to greater dangers. Proper follow-up studies and reports of sports doctors are necessary for recommendations and legislations on safety measures and specialised training schedules for hazardous events. Of course, it is acceded that in spite of the best of precautions e.g., modern gears, gadgets and guards any injury can be accidental, i.e., an unexpected event without any apparent cause. Many events are accidents and chance alone may determine their effect on man.

INVESTIGATIONS:

Very few injuries involve only a single factor. Investigations regarding the nature of factors are to be made.

Accidental factors—under apparently identical circumstances one sportsman may be injured whereas the other may escape. Unharmed survivors in mountaineering or auto-racing can throw more light to the causes of potentially dangerous accidents than injured or mentally disturbed participants. Some may be lucky to be "accident immune", whereas the other is nonimmune as may occur in any sickness or illness. The "near misses" are just as important as the direct accidents because they may create gross emotional disturbances. It may prove fatal in diving or underwater activities.

Chance—In any injury, chance may play a vital role in various circumstances. To some degree, i.e., by proper planning and education, chance can be anticipated (e.g., weather forecast in outdoor games and nature sports), but can never be completely eliminated.

FACTORS INCREASING THE INCIDENCE OF INJURIES:

Any lessening of physical fitness, emotional stability or alertness or morale increase the risk of injury.

A. *Accident or injury proneness*—There is a definite inter-relationship between injury proneness and physical fitness. Proverbially, a lame man falls into a ditch. The children of anxious parents are liable to be associated with a chronic anxiety state or anxiety neurosis. This factor should be looked for in injuries where direct causes are not apparent.

B. *Risk acceptance*—Greater the gain—greater the risk accepted now-a-days. High risk categories of sports and games offer special prizes or money. Thus participants accept risks for financial gains, personal glory and national honour. This of course is a very personal factor to survive or uphold an ideal as in war. Risk acceptance is likely to be more with modern safety devices and in welfare states where the participants get various benefits for incapacitation in any form.

C. *Human factor*—Includes both accident proneness and risk acceptance. Environment, upbringing, mood, fitness, etc., may be listed in human failure.

D. *Some medical conditions*—Congenital deformities or heart diseases, epilepsy, diabetes, mental instability, visual defects, should be borne in mind.

FACTORS DIMINISHING INJURY INCIDENCE:

Proper training and planning is necessary to keep athletes at their peak—physically and mentally. Pre-season check up is also essential.

I. A.) Assessing true athletic potentials.
   B.) Detecting any abnormality—congenital or acquired.
   C.) Any laxity of ligaments.
   D.) Any previous history or injury proneness.

II. Requisition of properly trained coaches and trainers who should "Study their Athletes" meticulously to find out their:
   A.) Physical ability and mental make up.
   B.) Individual motivation.
   C.) Reaction to severe stress and strain.

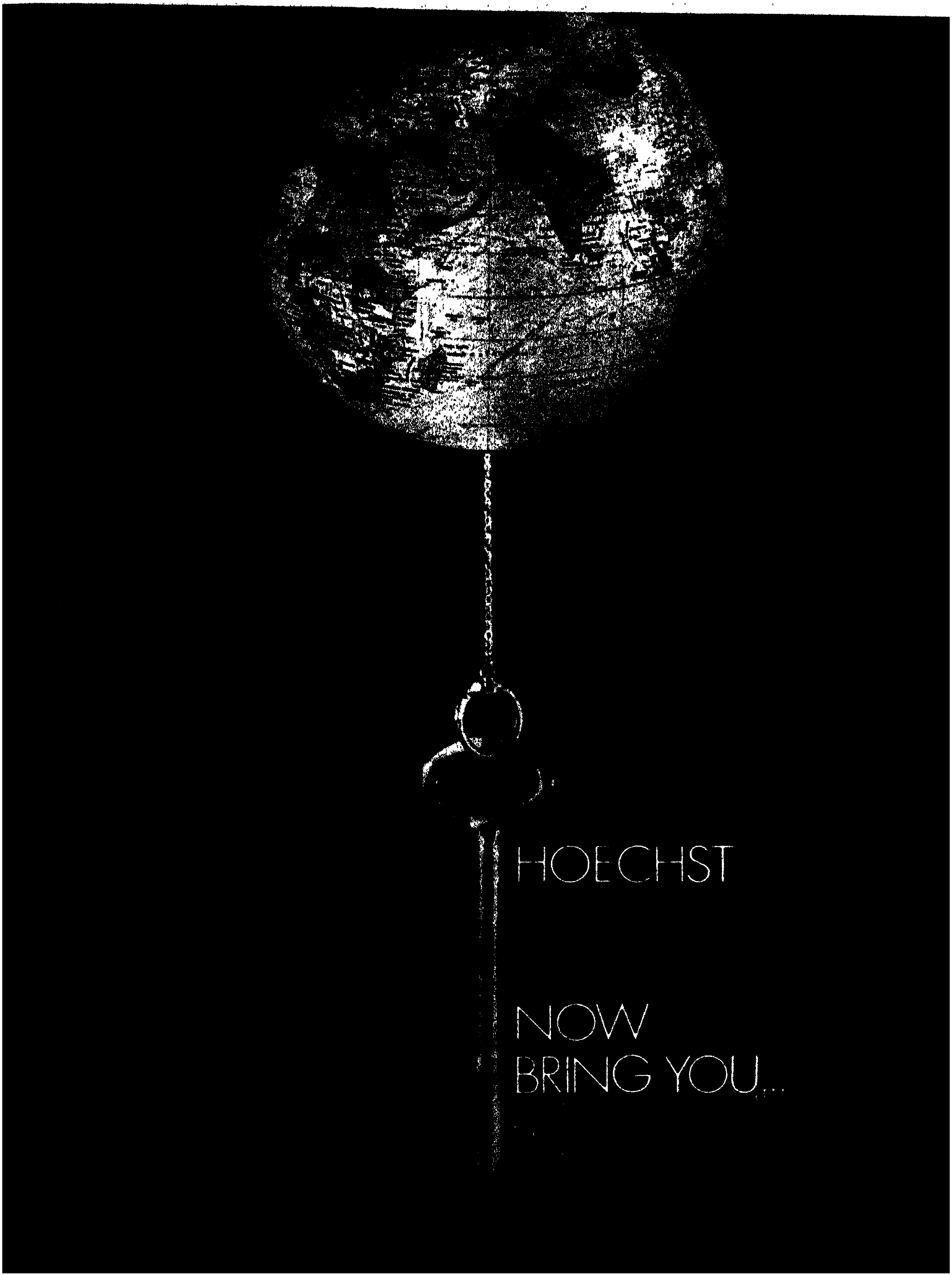
Skill and experiences—Assessment about the dangers inherent in diverse sporting activities.

Climate, temperature and environment—Various surfaces, natural or artificial, affect profoundly the incidence of injuries and highlights the importance of proper gears and equipment.

Thus a medical commission on injury prevention in sports and games should be the appropriate body. It should assess the various above factors and aim to be near "perfect".

COMMENTS

In Sports Medicine Research, the difference between the injured and the non-injured participants in an athletic activity needs attention. Without such differential data, planning for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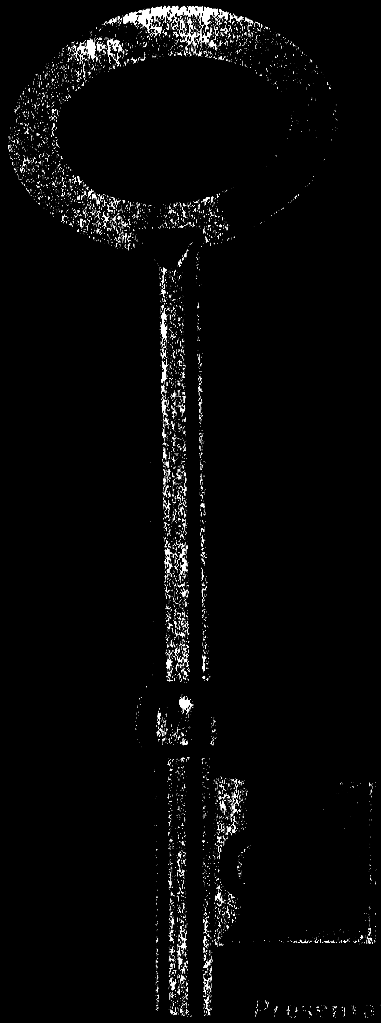

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prevention will remain in the realm of speculation rather than scientific hypothesis testing. Uniform accepted research design techniques along with care of National Health Problem right from school going age with proper channelisation of talents after assessing the true athletic potentials of the participants are called for. It should be borne in mind that like the meticulous rearing up of any "Race Horse" as a special class, the right age of starting rigorous modern competitive athletics is at puberty. i.e., after complete psychosomatic maturation is achieved to improve the "Strength, Skill, Speed, Stamina, Suppleness, Suffering and (P)sychology", i.e., the seven sermons in modern sports medicine. All but skill and psychology can be improved upon by appropriate "circuit" and "interval" training and suitable "Conditioning" programmes, thereby lessening the incidence of Traumas in Sports.

SUMMARY

Some aspects of sports injuries e.g., proper reporting, correct recording according to nature, site, severity, etc., human factors, chance factors, degree of training and fitness, skill and experience, environment, accident proneness. encouragement of increasing risk acceptances by Welfare States to their participants are highlighted. A suitable medical commission or team on planning for "injury prevention" in sports and games is recommended.

5

Experience of Self-Divided Cutaneous Nerves

G. S. SEKHON*

[Received for publication January 10, 1973]

The easy availability of long segments of lateral cutaneous nerves of the thighs have lent themselves for being used as donor grafts during nerve grafting operations. The large areas of cutaneous anaesthesia following such procedures tempted the author to divide these nerves in half a dozen diabetics, to produce anaesthetic patches on their thighs for painless insulin injections (Sekhon, 1971). However, with a view to obtain first hand knowledge about the effects of such extensive cutaneous denervations the author divided his lateral cutaneous nerves a little below the anterior superior iliac spines. A number of interesting observations were made and are considered worth reporting.

MATERIAL AND METHOD

From a study of the course of the nerves in the cadavers and on actual cases undergoing neurolysis for meralgia paraesthetica, it was noted that the nerve could be palpated as a vague resistant vertical ridge below the anterior superior iliac spine when the thigh was fully extended. It was felt with greater difficulty in hyperextension at the hip because of the stretching of the surrounding tissues and it became impalpable after the first ten degrees of flexion at the hip joint as it sank into the depth of the fossa below the anterior superior iliac spine, bounded on either side by the sartorious and tensor fascia lata muscles. It was here that the author blocked the nerve during skin grafting procedures for taking partial thickness grafts, and also divided the nerve in diabetics for painless insulin injections and in his own thighs in 1965 for the present study. A daily record of the observations was maintained for the first few weeks, then twice a week for one year and subsequently every few months for the last 8 years.

OBSERVATIONS AND DISCUSSION

Immediately after the division of the nerves under local anaesthesia, while pulling up the underwears across the anaesthetic patches, a peculiar 'chit-chit' like sensation was perceived locally, very much like the one experienced while putting on a terylene shirt. Such has also been the experience of a colleague who volunteered for temporary block of his nerves with xylocaine infiltration. This unusual sensation may be explained on the basis of released deeper sensibility innervated through branches of the femoral nerves supplying the deeper aspect of fascia lata ; the stimulus in this case being the movement of the skin and subcutaneous tissues over the deep fascia or the bending of hair transmitted through the hair roots.

While walking off the operation table, a peculiar sense of light weightedness was experienced as if 50 per cent of the body weight had been taken away, a feeling somewhat akin to that felt immediately after a dash. This lasted for half an hour. The tissues deep to the area of sensory loss felt tired and heavy, again as if fatigued in a race. This was responsible for shorter steps and slower gait with a distinct

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sense of instability while walking, again bearing some resemblence to the sort of feeling experienced after a tiresome exercise. A sense of hyperaesthesia and ache was felt under and around the anaesthetic patches. This was especially marked a little above and lateral to patellae i.e., over the lower parts of the iliotibial tracts. All these features appear to be manifestations of released deeper sensibility innervated through the deeper nerves. The lower parts of the iliotibial tracts being relatively less padded felt most hypersensitive.

Objective findings—There was complete sensory loss to cotton wool touch from the level of greater trochanters to the upper borders of the patellae, over the anterolateral aspects of the thighs with loss of pin prick and temperature sensibility over a smaller area. Penetrating the anaesthetic skin with needles was absolutely painless only after pinching up a fold of skin from the underlying deep fascia, otherwise a sickening sensation was felt due to pressure being transmitted to the deeper intact nerve endings in the iliotibial tracts. However, sharp localised pain was only felt when the needles were made to penetrate the deep fascia.

The anaesthetic areas were warmer to the touch due to inadvertent division of the associated sympathetic fibres to the blood vessels accompanying the somatic sensory nerves. A maximum rise of 20°C of temperature was recorded in the centre of the anaesthetic areas. This is contrary to the subsequent fall of temperature which occurs after passage of time following nerve injuries. On rolling a finger from the normal to the anaesthetic areas a vague sense of a step or swelling of the anaesthetic part was felt. A similar sense of swelling is also felt in the anaesthetic areas following novocaine or xylocaine blocks for other purposes, such as. following inferior dental nerve block for tooth extraction. This, again, appears to be a manifestation of disturbed balance of sensibility between the normal and the anaesthetic skin. However, the possibility of true swelling of the denervated tissues brought about by local hyperaemia due to associated sympathetic block cannot be excluded with certainty. This aspect is being explored. This local hyperaemia may also be partly responsible for the local sense of fatigue simulating the one following exercise. Incidentally, a sense of mild local fatigue was felt even as long as one year after the neurectomy after prolonged car travel. As some local rise of temperature was still evident, this seems to lend support to the idea of hyperaemia, being responsible for the ache.

A study of the effect of pressure over the anaesthetic patches revealed that mild pressure did not have any adverse effect but increasing pressure exerted against the femur led to an unpleasant ache through a stage of hyperaesthesia. Similar sensation was also felt while brushing the hand firmly across the anaesthetic areas. This was more marked while doing the same transversely than vertically. This was probably due to a greater stretch being transmitted to the deeper intact nerve terminals in a transverse direction as the major constituents of the thighs, the thigh muscles, can be displaced more transversely than vertically. It may also be worth recording that fluid injected into the subcutaneous tissues also caused a sense of ache somewhat resembling local fatigue due to the oedema and pressure being exerted on the deeper tissues. However, the effect was minimised if a fold of skin and subcutaneous tissues was lifted off from the deep fascia.

First postoperative day—The follwoing morning, a mild sense of feverishness was felt due to the operative trauma. There was a moderate degree of pain at the operation site. The sense of local tiredness and ache was nearly 50 per cent less as compared to the previous day. Sudden movements at the hip joints resulted in sensations resembling electric shocks across the anaesthetic areas presumably due to stimulation of the divided proximal nerve endings.

Infiltrating 4 ml. novocaine solution into the anaesthetic subcutaneous tissues of the right thigh was followed by a dulling of the sense of ache to pressure and rubbing. The needle pricks were painless but a mild dull dispersed pain was felt during the advancement of the needle through the subcutaneous tissues prior to novocaine infiltration. However, the same was not perceived if a fold of skin was pinched up during the advancement of the needle. Infiltration of the opposite thigh with distilled water was also followed by dulling of unpleasant sensation to pressure, a feature somewhat resembling the relief from massage of fatigued tissue.

Second postoperative day—The sense of muscle ache was only about 25 per cent of the previous day and rubbing the area was only 10-15 per cent uncomfortable. Only 1-2 electric shocks were experienced on each side while turning in bed or during bending movements. Feverish feeling was less evident. Other findings remained unchanged.

Third postoperative day—The sense of feverishness was completely gone. Electric shocks were felt in the denervated areas as before.

Formications were felt on a couple of occasions across the denervated areas. These somewhat resembled the sense of itching felt during the healing of a wound. This may be due to the commencement of the healing process of the divided nerves being projected to the cutaneous distribution of these nerves as a result of central misinterpretation. Twice a sensation was felt as if cold water was being sprinkled over a few places in the anaesthetic areas. Turning in bed produced unpleasant pain referred to the anaesthetic patches. Straining led to pain being felt in the middle of these areas. A velvety feel was perceived on gently passing a hand across the anaesthetic areas. This however. became unpleasant if pressure was increased. There was an occasional flicker and fasciculation of a few muscle fibres over the lower part of the back of the chest on the right side as well as of the quadriceps on the same side. This might have been the result of excitation of the corresponding anterior horn cells of the cord, from the quadriceps due to overflow of stimuli from an irritable focus probably set up in the posterior horn cells of L2 and L3 segments where the divided and hence irritated proximal cut ends of the lateral cutaneous nerves ended. The flickering of the muscle fibres of the lower part of the back of the right chest may have a similar basis though through the agency of the internuncials to the adjoining cord segments.

Fourth postoperative day—The electric shocks were replaced by a sense of hot iron rods being poked into the anaesthetic parts on a couple of occasions. These were excited by movements at the hip joints thereby stimulating the proximal cut ends of the nerves. Moderately severe cutting pain sensation was also felt on the outer side of the right thigh on half a dozon occasions during quick flexion of the knees along with flexion and lateral rotation at the hips (sartorious action) necessitated during the putting on of socks or while doing shoe laces (again probably due to proximity of the sartorious muscle origin irritating the divided nerve stumps). Muscle ache was only 5-10 per cent of that of the first day. Gentle pressure, applied below the anterior superior iliac spines, led to mild shooting pain down the outer surfaces of the thighs (Tinel's sign).

Seventh postoperative day—Only a couple of minor electric shocks were felt during brisk walking. Hyperextension at the hip joints as well as quick walking also resulted in 'chit-chit' like sensations over the thighs. Formications were felt on a dozen occasions without any evident exciting cause. Tired local feel was only 5 per cent of the first day. Pain on pressure was also less severe and major electric shocks were a rarity.

Subsequent progress—The subsequent progress manifested progressive regeneration and the phenomenon associated with it. This was evidenced by returning sensations and Tinel's sign being positive more and more distally. The average rate of regeneration was about one millimetre per day. Regeneration followed a definite pattern on both the sides. It was in the form of three vertically running strips of sensation on stroking the nerve trunks. The recovery was fastest in the anterior strip, slower in the middle strip and slowest in the posterior. This probably reflected the final breakup of the nerves into three main branches. After a period of six months these three strips of radiating formications on tapping the nerves were replaced by a more diffuse sensation. The formications were especially marked over the lower parts of the iliotibial tracts i.e., above and lateral to the patellae, the areas that had always been more hypersensitive. Gradually the anaesthetic patches shrunk in size till these were broken up into islands of anaesthesia and hyperaesthesia by the end of the ninth month. By the end of the year, the anaesthetic patches were no more in existence and the touch and pin prick responses revealed formications and hyperaesthesia instead.

During the course of study it was also noted that the anaesthetic skin became dry and crispy like hair after the 10th day. The local sense of warmth and discomfort during the hot weather in the early postoperative period was thought to be at least partly due to cutaneous sympathetic denervation and atrophy of the 'body-coolers'—the sweat glands and not solely the result of local vasodilatation following sympathetic denervation of the cutaneous blood vessels. To prove that it was really so, the author closed himself in an improvised 'climatic chamber' consisting of a small room fitted with a humidifier and a heater. The room temperature was maintained constant at 37°C while the humidity was raised to almost saturation point (wet thermometer reading being 33°C). This produced a sense of oppression, flushing of the face, increased respiratory rate and profuse sweating (except from the denervated skin), indicating thereby a maximum effort on the part of the temperature regulating mechanism in preventing the body temperature from rising beyond the normal. This evidently meant maximum cutaneous vasodilatation also. The oral temperature rose to 37°C from its initial value of 36°C.

The cutaneous temperature showed a steeper rise from 33°C to 36°C, the anaesthetic skin being even warmer by ½°C. This half a degree higher temperature of the denervated skin as compared to the surrounding normal skin in our opinion is a reflection of the role of now denervated 'body-coolers'—the sweat glands. Half a degree difference of oral and denervated skin temperature can be explained on the grounds of some autonomous sweat gland function plus limited evaporation from the dry skin since the denervated skin was after all only dry and not dehydrated.

It was also observed that the hairs were more sparse over the right greater trochanter as compared to the thigh below or over the opposite trochanteric region. This was thought to be due to pressure atrophy of the hair follicles, the result of predominant habit of sleeping on the right side. As a result of further interrogation of some of the normal persons it was concluded that by noting the relative distribution of hair over the pressure points on the limbs and trunk a fair guess could be made about the sleeping habits of an individual.

Comparison with other nerve injuries—The author had also the experience of having sustained a small glass cut on the thenar eminence of the left hand injuring one of the digital nerves. The sense of irritation in the distribution of the nerve took thirty years to disappear completely. Hence, the presence of formications and local hyperaesthesia, 8 years following the division of the lateral cutaneous nerves of the thighs, is not surprising. 'Moreover, eye strain and aches in the eye is still felt eight years after the diathermy treatment for partial detachment of the author's retina. Therefore, it will not be wrong to infer that it is liable to take as much as to three decades for the residual effects of nerve injuries to pass off completely.

It may also be of interest to note that the basic pattern of subjective features following injury to a somatic nerve or one of the special sensees is alike although the clinical manifestations naturally differ. That such a parallelism does exist will be evident from a broad comparison between the sensations perceived following self inflicted lateral cutaneous nerve injury in 1965 and the diathermy trauma to the optic nerve terminals in the retina as a part of the treatment for retinal detatchment in 1964. In both the cases the earlier unpleasant sensations (electric shocks and hot iron rods being poked into the thighs in the case of lateral cutaneous nerve injury and unpleasant flashes of light in the case of optic nerve irritation) progressed to milder and more acceptable formications and aches respectively in due course of time.

SUMMARY AND CONCLUSIONS

The subjective sensations and objective findings following self divided lateral cutaneous nerves of the thighs are described.

The early manifestations are partly due to irritation of the proximal divided nerve endings with symptoms referred to the peripheral distribution of the nerves due to central misinterpretation and partly due to a disturbed balance between the divided cutaneous nerves and the intact deeper ones i.e., a release phenomenon of deeper sensibility.

There exists a broad parallelism in the clinical manifestations and progress following somatic sensory nerve injuries and to those of special senses.

Although nerve regeneration and recovery of function can be expected at the rate of one millimetre per day but normalisation of function is likely to take two to three decades.

The initial rise of local temperature following sensory denervation of the skin appears to be partly due to inadvertent cutaneous sympathetic denervation of the blood vessels and partly the result of atrophy of the 'body-coolers',—the sweat glands.

By observing the distribution of hair over the pressure points a reasonable guess can be made about the sleeping habits of an individual.

Although the short term results of producing anaesthetic patches on the thighs by percutaneous division of these nerves in diabetics for painless insulin injections are quite satisfactory, but regeneration and hyperaesthesia after a period of one year prohibits the use of this procedure for this purpose.

The complete absence of trophic changes, 8 years after nerve divisions even in the diabetics, justifies the donor role for the lateral cutaneous nerves of the thighs during nerve grafting operations, since the price paid in the form of minor sensory disturbances is relatively small.

REFERENCE

SEKHON, G. S.—*Punjab Med. J.*, 21: 105, 1971.

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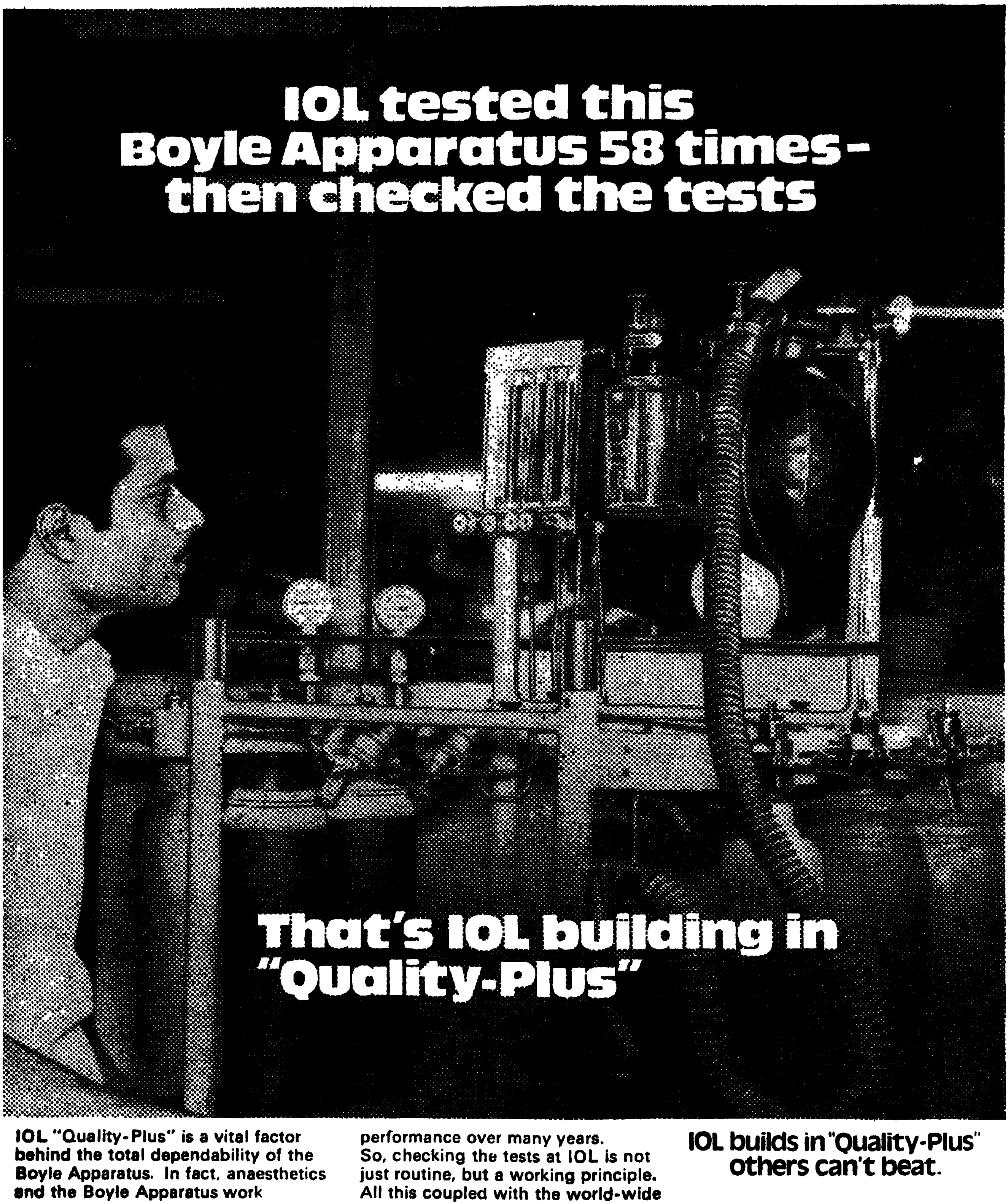

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6

Lesions of the Breast

S. J. BAPTIST*, JOHN A. THOMAS**
S. N. KOTHARE***

[Received for publication May 2, 1972]

Studies on the incidence of malignancies in Indian women by Paymaster (1956 and 1964), Ram Mohan and Gopal Rao (1968), Reddy (1968) and Reddy and Sarada (1968) revealed that carcinomas of the breast had a high incidence.

This is an analysis of the material available with us in an effort to examine the pattern of inflammatory breast lesions, mammary dysplasias, benign and malignant tumours of the breast and to study their relationships.

MATERIAL AND METHOD

142 specimens of breast tissue were received between the period of April 1966 and March 1971 by the Department of Pathology, St. John's Medical College, Bangalore. Section, made from these specimens, were stained routinely with haematoxylin and eosin. Where considered necessary, the Periodic Acid Schiff, with and without digestion, the Alcian-blue — P.A.S., mucicarmine, Congo red, Van Gieson and Von Kossa's silver nitrate stains were used. The modified Mallory connective tissue stain as a stain for keratin (Ayoub and Shklar, 1963) was also used to detect keratin in cases of squamous cell carcinoma of the breast.

The neoplastic diseases were classified on the recommended international histological typing of breast tumours (Scharff and Torloni, 1968).

RESULTS

One hundred and sixty-four lesions of the breast were covered in this study as shown in Table 1.

Table 1—*Showing the Incidence and Types of Breast Lesions*

Breast lesion	Number of lesions (Total: 164)	Percentage of total
1. Inflammatory lesions	18	11
2. Benign mamary dysplasias	46	28
3. Benign tumours	39	24
4. Carcinomas	61	37

The inflammatory lesions were 18 in number and constituted 11 per cent of the total number of cases recorded by us.

Benign mammary dysplasias—In concurrence with the standard terminology recommended by the W.H.O. (Schraff and Torloni, *loc. cit.*), the term mammary dysplasia was used in preference to many terms in current use, such as, fibrocystic disease, chronic mastitis and fibroadenosis. There were 46 lesions of benign mammary dysplasia giving an incidence of 28 per cent of the total lesions of the breast (Table 1). 44 were in females and 2 in males. Amongst the females the youngest patient was 15 years and the oldest was 60 years old with the highest incidence in the 41-50 year age group (Fig. 1). One of the male patients was aged 48 years and had the lesion of benign mammary dysplasia associated with carcinoma in the left breast, the other was 49 years and had gynaecomastia in the right breast.

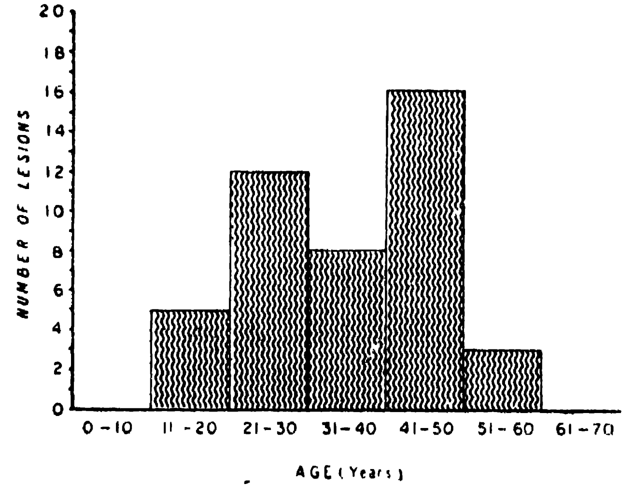

Fig. 1—Showing the number and age incidence of benign mammary dysplasias in female patients

The association of benign mammary dysplasias with other lesions of the breast was also observed—5 with fibroadenoma alone, 10 with carcinoma alone and 4 with fibroadenoma and carcinoma occurring together in the same breast.

Certain special features were noted in each lesion of benign mammary dysplasia and were listed in order of predominance (Fig. 2). Adenosis was the most common special feature seen in 46 lesions of benign mammary dysplasia No correlation was found between the occurrence of special features and the age of the patients nor was there a sequential correlation

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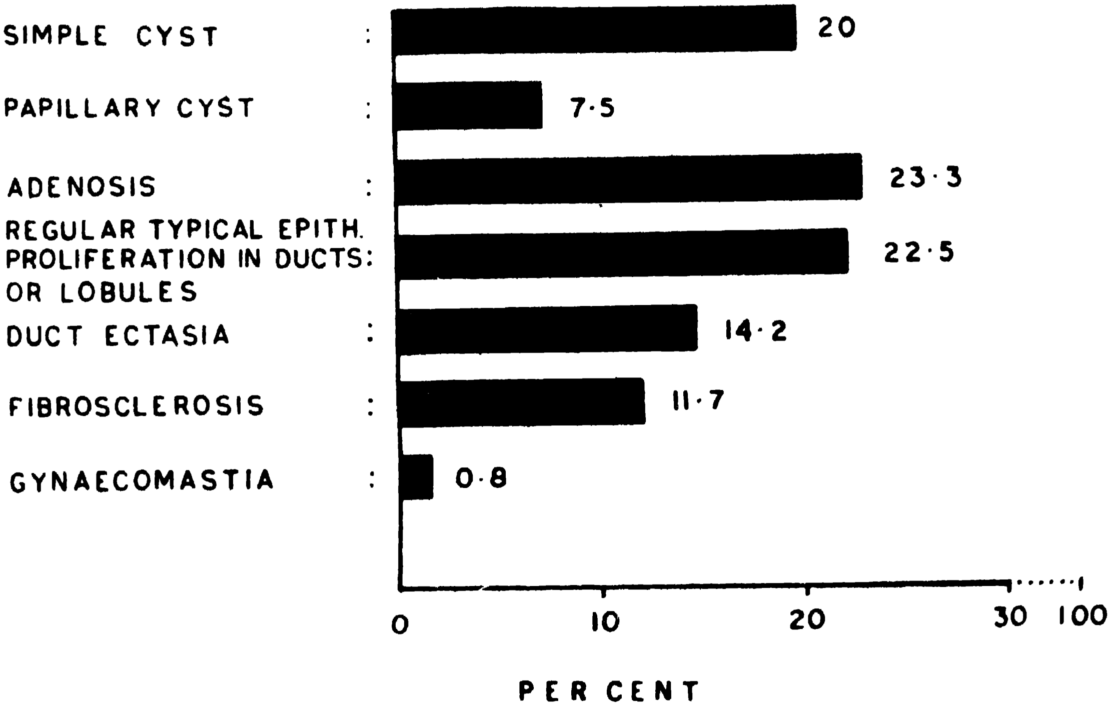

Fig. 2—Showing special features of benign mammary dysplasias and percentage of each

between the various dysplasias to indicate transition from one type into another.

Benign tumours—There were 39 benign tumours giving an incidence of 24 per cent of the total breast lesions (Table 1). Of these 8 were pericanalicular fibroadenomas, 28 were intracanalicular fibroadenomas—simple type, and 3 were cellular intracanalicular fibroadenomas. The latter (cellular intracanalicular fibroadenomas) are also known popularly as cystosarcoma phyllodes.

Thirty-eight of these fibroadenomas were from females and one from a male. The youngest female patient in this group was aged 14 and the oldest 46 years with the highest incidence in the 21-30 year age group (Fig. 3). Of these 38 fibroadenomas, 5 were associated with benign mammary dysplasia alone, 4 were associated with the benign mammary dysplasia and carcinoma occurring together in the same breast but none were associated with carcinoma alone. Nine of the 38 fibroadenomas were thus associated with some other lesion in the same breast.

The lone male patient was 20 years old and had a simple type of intracanalicular fibroadenoma with elements of the pericanalicular type. It was not associated with any other lesions in the breast.

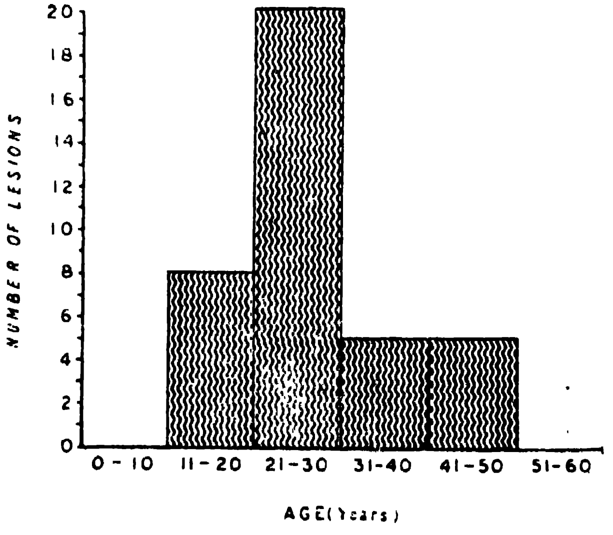

Fig. 3—Showing the number and age incidence (benign tumours in female patients

Carcinomas—Thirty-seven per cent of the tot breast lesions were carcinomas (Table 1). Onl one of these was in a 48-year-old male who ha an infiltrating type of carcinoma which wa associated with a benign mammary dysplasi in the same breast. Amongst the female patien the youngest was 22 years and the oldest 8 years. The highest incidence was observed in the 41-50 year age group (Fig. 4). These lesions of the breast in female patients were classified as shown in Table 2. The special histological variants of carcinoma of group III are listed in Table 3. The notable features of this group are the single lesion of mucous carcinoma and the two lesions of squamous cell carcinoma. The lesion of mucous carcinoma of the breast showed a mixture of mucous carcinoma and infiltrating carcinoma and has been classified as a mucous carcinoma—mixed variety (Table 3) on the basis of the classification for mucous carcinoma used by Silverberg *et al.* (1971). This patient was 40 years old and had a lump in her right breast for 8 years prior to surgical removal. She is apparently in good health two years after the operation.

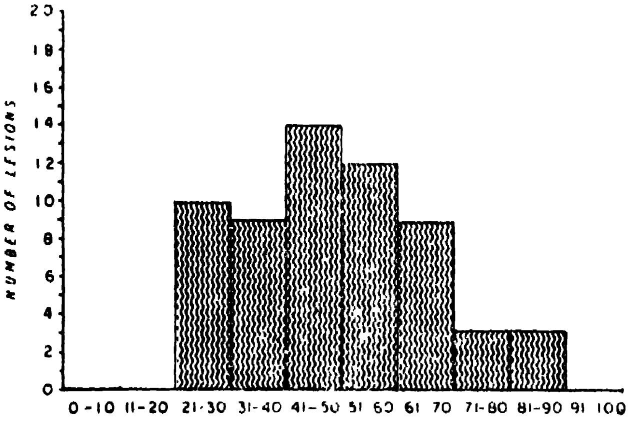

Fig. 4—Showing the number and age incidence of carcinomas in female patients

Table 2—*Showing Grouping of Carcinomas in Female Patients*

Group	Carcinoma	No. of lesions (Total : 60)
I	Intraduct non-infiltrating carcinoma	2
II	Infiltrating carcinoma	49
III	Special histological variants of carcinoma	9

Table 3—*Showing Special Histological Variants of Carcinoma (group III) and Number in Each*

Special histological variants of carcinoma (group III)	No. of lesions (Total : 9)
a) Medullary carcinoma	Nil
b) Papillary carcinoma	3
c) Cribriform carcinoma	1
d) Mucous carcinoma	1 (Mixed variety)
e) Lobular carcinoma	Nil
f) Squamous cell carcinoma	2 (one mixed and one pure
g) Paget's disease of the breast	2

Of the two lesions of squamous cell carcinoma of the breast in this series one contained squamous metaplastic foci in an infiltrating carcinoma and was classified as a mixed squamous cell carcinoma whereas the other was classified as a pure squamous cell carcinoma and was from a 30-year-old woman. Step serial sections of the latter lesion were taken to determine the site of origin of the tumour. Changes seen in the overlying skin suggested an epidermal origin. These lesions of squamous cell carcinoma were classified following the method used by Cornog *et al.* (1971).

Forty-nine infiltrating carcinomas fell under group II (Table 2) and formed the largest group accounting for 81.6 per cent of the carcinomas in female patients. These lesions were graded histologically according to W.H.O. recommendations on the following criteria: 1) Tubule formation; 2) hyperchromatism and mitosis of epithelial cells; and 3) irregularity of size, shape and staining of nuclei of epithelial cells. Table 4 summarises the results using these criteria.

Table 4—*Showing the Grading of the Infiltrating Carcinomas (Group II) and Presence or Absence of Metastatic tumour in the Lymph nodes of these Lesions*

Grade of primary tumour	No. of primary lesions	No. of primary lesions with lymph nodes histologically examined	No. of primary lesions histologically examined showing metastases
Grade I	2	2	Nil
Grade II	5	3	1
Grade III	42	25	21

Of the 61 lesions of carcinoma of the breast 10 were associated with benign mammary dysplasias alone and 4 were associated with benign mammary dysplasia and fibroadenoma occurring together in the same breast. Another patient in this series aged 30 years had a fibroadenoma in the right breast and a squamous cell carcinoma (pure type) in the other.

The presence of lymphocytic infiltration in the stroma was observed in 53 of 61 carcinomas. These included 1 from group I, 43 from group II (the carcinoma in the male patient belonged to group II grade III and has been included here) and 9 from group III. Of the 43 carcinomas in group II lymphocytic infiltration in the stroma was seen in five of these which were of Grade II and 38 which were of grade III types and none of these belonged to grade I.

DISCUSSION

Benign mamary dysplasia—Frequent association of benign mammary dysplasia with other lesions of the breast was noted ; whereas fourteen of these mammary dysplasias were associated with carcinoma in the same breast, the highest incidence of benign mammary dysplasia and the highest incidence of carcinoma of the breast fell in the same 41-50 year age group (Figs. 1 and 4). The solitary instance of carcinoma of the male breast in a 48-year-old patient also showed a benign mammary dysplasia. Our findings, though small, are significant and offer some support to the contention that there is a relationship between the mammary dysplasias and carcinoma of the breast.

Kuzma (1957) suggested that on the basis of histologic interplay (in the lobule) between epithelium, myoepithelium, lobular connective tissue, stromal connective tissue and inflammatory cells, mammary dysplasia could be multiform : a) Mazoplasia, b) chronic cystic mastitis with epithelial hyperplasia, c) adenosis, d) sclerosing adenomatosis, e) intracanalicular firboadenoma, f) adenoma and g) lobular carcinoma. We found no sequential changes in the special features of benign mammary dysplasia to indicate an evolutionary process, nor was there any correlation between the occurrence of the special features and the age of the patients. We also observed a variety of special features in each lesion of benign mammary dysplasia but found it remarkable that different regions of the same breast show such a varied response to apparently the same stimulus.

Benign tumours—All benign tumours in this group were fibroadenomas. It was noted that the age group showing the highest incidence was 21-30 year. This age group was much lower than the age group which showed the highest incidence for the benign mammary dysplasias and carcinomas. In our series it was interesting to note the presence of a triple lesion—carcinoma, benign mammary dysplasia and fibroadenoma in the same breast. This fact emphasised the need for multiple tissue blocks when reporting on a breast tumour.

There were only three cellular intracanalicular fibroadenomas (also known as cystosarcoma phyllodes). In this series it was not possible to corroborate the statements of other Indian workers like Aurora and Gupta (1967), Chander *et al*. (1969), and Mankodi *et al*. (1971) which pointed towards a higher incidence of cystosarcoma phyllodes in India, compared to that of the Western countries. The mean age of patients in the series of Mankodi *et al* (*loc. cit.*) was 33 years, and 39.5 years in the series published by Chander *et al*. (*loc. cit.*). The average age reported by Lester and Stout (1954) and Oberman (1965) was 44 and 49 years respectively. The three patients reported in this series were 20, 22 and 28 years old. It could be hypothesised that cystosarcoma phyllodes occurs in a younger age group in this part of India.

Carcinomas—The highest incidence of carcinoma of the breast was observed in the 41-50 year age group. This corresponds to the finding of Paymaster (1956) who reported the highest incidence in Indian women in the 45-49 year age group and second highest in the 40-44 year age group in a series of 500 cases of carcinoma of the breast. He also observed that this high incidence in the 45-49 year age group was identical to that observed in Western countries. However, other workers in India like Ram Mohan and Gopal Rao (*loc. cit.*) and Reddy *et al*. (*loc. cit.*) opined that carcinoma of the breast occurs much earlier in Indian women.

Forty-nine lesions of carcinoma in this series belonged to the infiltrating carcinoma group (Table 2) and of these 42 were graded as grade III. Lymph nodes were available for study in 25 of these 42 lesions and in 21 they were associated with metastatic tumour in their lymph nodes. Thus, a large number of carcinomas were in quite an advanced stage and a probable poor prognosis could be predicted in these patients. The rarity of malignancy of the male breast is well known. Scarff and Smith (1941) recorded 15 cases of cancer in a series of 65 mammary lesions in males during the years 1924-1940 and Willis (1967) recorded 2 cases of carcinoma of the male breast over a period of 14 years. There was a solitary instance of carcinoma of the male breast in our series.

Silverberg *et al*. (*loc. cit.*) observed that colloid carcinoma, pure or mixed variety, was a relatively uncommon form of mammary cancer. Their figures for 5-year survival rates of pure colloid carcinoma, mixed colloid carcinoma and infiltrating duct carcinoma were 67.9 per cent, 61.5 per cent, and 46.3 per cent respectively. They demonstrated that colloid carcinoma had a better prognosis than infiltrating carcinoma of the breast. There was only one lesion of mucous carcinoma (also known as colloid carcinoma or gelatinous carcinoma) in our series, and this was classified as a mucous carcinoma—mixed variety (Table 3). This lesion showed a good prognosis.

Cornog *et al.* (*loc. cit.*) noted that pure squamous carcinoma was uncommon in their series and when present was represented by a squamous carcinoma arising in a cystosarcoma phyllodes and by two tumours which, from their anatomic relationship, may have arisen from the epidermis. In our series there were two lesions of squamous cell carcinoma of the breast. One of the lesions contained squamous metaplastic foci in an infiltrating carcinoma and the other, a pure squamous carcinoma. arose from the epidermis of the overlying skin.

That the presence of lymphocytic infiltration in the stroma may be of prognostic importance has been mentioned in the histological typing of breast tumours (Scharff and Torloni, *loc. cit.*). In our series, lymphocytic infiltration in the stroma was detected in 43 of the 50 infiltrating carcinomas (group II), but none of these belonged to grade I. It is interesting to speculate on the role of lymphocytes in such lesions. This may be an expression of an antigen-antibody reaction or an inflammatory reaction to the presence of cancerous tissue.

SUMMARY

A series of 164 lesions of the breast from 140 patients have been analysed.

Amongst the lesions of the breast, carcinoma of the breast ranks first in women in this region.

The findings reported here support the contention that a relationship exists between benign mammary dysplasia and carcinoma of the breast.

Multiple blocks of tissue should be taken from various parts of the specimen in order to exclude malignancy.

Rare lesions like squamous cell carcinoma in two females, and a carcinoma and a fibroadenoma in two males have been recorded.

ACKNOWLEDGMENT

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1

Carcinoma Developing in Gall Bladder Remnants

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There are certain occasions, when even a very experienced surgeon feels safer to do a cholecystostomy rather than cholecystectomy. A less experienced surgeon may leave a portion of the gall bladder when he encounters difficulty. These situations are not dangerous as long as the surgeon and the patient realise the need to remove the remains of the gall bladder under more favourable conditions. Unless this is done, the result may be catastrophic since there is an increased incidence of development of carcinoma in a gall bladder remnant. Two such cases are discussed and the literature reviewed.

Between January 1935 and December 1968, 46 cases of malignant tumours of the gall bladder were encountered at Ottawa General Hospital, Ottawa (Tanga and Ewing, 1970). Of these 46 cases, malignant tumours developed in two patients with gall bladder remanants.

CASE REPORTS

Case 1—Mrs. J. C., 51-year-old female was admitted to Ottawa General Hospital on 13-3-1935 with a history of persistent severe right upper quadrant pain in the abdomen of a few weeks' duration. She had also noticed a mass in the abdomen below the right rib cage. This mass was painful and increased in size very rapidly. One year prior to this admission, she had cholecystostomy for cholelithiasis. She felt better after that till the onset of the present illness.

On examination the patient was anaemic and emaciated. There was a tender mass in right hypochondrium. Routine laboratory investigations were within normal limits except for anaemia.

At surgery a huge mass was encountered in the region of the gall bladder. This neoplastic mass was beyond resection. Hence biopsy was done which revealed adenocarcinoma. Patient died the day after surgery in hypotension.

Case 2—Mrs. L. L., a 77-year-old lady, was admitted to Ottawa General Hospital, Ottawa, for the first time on 6-9-1968. Two years prior to this admission, she started having periumbilical pain. Initially, the pain was intermittent, dull and did not radiate. Her appetite was good and there was no fatty food intolerance. She had lost eight kg. of weight in the previous nine months.

In 1918, she had an abdominal operation, the nature of which is not clear. Cholecystostomy was done for cholelithiasis in 1938. Carcinoma of cervix uteri was treated with radium implantation in 1947.

Patient was moderately obese. She also had a small umbilical hernia. During her stay in the hospital, she developed severe nausea and vomiting. The pain in the right upper quadrant of the abdomen increased in severity and was radiating to the back. She also developed tenderness and rebound tenderness in the right hypochondrium. On September 11, she was found to be jaundiced. At this stage, a diagnosis of acute cholecystitis was entertained.

On 13-9-1968, serum bilirubin, serum alkaline phosphatase and transaminase levels were high. Investigations revealed anaemia. Occult blood in stools was positive on two occasions. Urine culture grew coliform organisms with a colony count of 100,000/mi. and sensitive to most antibiotics. Intravenous cholangiogram did not reveal any dye in biliary tree.

On September 19, she was operated on. At the site of previous cholecystostomy, the gall bladder was adherent to the anterior abdominal wall and this area was hard to feel. Frozen section study of a piece from the fundus of the gall bladder (from the area of previous cholecystostomy revealed doubly refractile bodies and anaplastic carcinoma. Cholecystectomy, exploration of the common bile duct (no stones found), operative cholangiogram, "T" tube drainage of the common bile duct, and gastrostomy were carried out. Paraffin section confirmed the quick section diagnosis. The final histological diagnosis was chronic cholecystitis, cholelithasis, squamous metaplasia, adenoacanthoma, secondary adenoacanthoma of liver due to direct extension. Postoperatively, she developed superficial wound infection. Besides this, the recovery was uneventful and she was discharged on 28-10-1968.

She was re-admitted on 7-11-1968 with gradually increasing abdominal distension, jaundice and vomiting. She had marked jaundice and massive ascites. Investigations revealed anaemia. Total serum bilirubin was 7.2 mg. per cent with direct serum bilirubin of 4.3 mg. per cent. Prothrombin time was

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26 per cent. Serum alkaline phosphatase was 18 6 Bodansky units. X-ray of abdomen was suggestive of massive ascites. She died on 2-12-1968.

Autopsy revealed: (1) Extensive local infiltration in the porta hepatis; (2) extensive metastasis to the liver; and (3) ascites-4,000 ml.

DISCUSSION

Arner and Von Schreeb (1958), first reported the occurrence of carcinoma of gall bladder in the gall bladder remnant. Joseph *et al.* (1958), in the same year after clinical and experimental considerations, concluded that stasis, chronic inflammation and mechanical irritation are important factors in the development of carcinoma of the gall bladder. All gall bladder remnants satisfy the above criteria of stasis, infection and mechanical irritation.

Cowley and Wood (1964) reported four more similar cases. In the interval between 1947 and 1962, they had 51 patients with perforated gall bladder. Of these, six cases were discovered at autopsy. Of the remaining 45 cases, cholecystectomy was done in 28, cholecystostomy in two and enterostomy with removal of obstructing gall-stones in the remaining 13 patients. Four patients among these developed carcinoma of the gall bladder. This is a much higher incidence. Robertson and Carlisle (1967) have reported two similar cases.

In our first case, cholecystostomy was done one year prior to the development of carcinoma of the gall bladder. The reason for not doing cholecystectomy initially was not known. Biopsy at the time of initial cholecystostomy did not reveal malignancy. A year later, an inoperable carcinoma was found. Initial cholecystectomy or cholecystectomy soon afterwards may have prevented this malignancy.

In our second case, the reason for not doing cholecystectomy initially is not known. Cholecystostomy was done elsewhere. She felt better for about 28 years after the cholecystostomy. Thirty years after the initial cholecystostomy, adenoacanthoma of the gall bladder was found. In this case, unlike the first case, there was plenty of time to do a planned cholecystectomy. The patient was not asked to return for definitive surgery after cholecystostomy.

SUMMARY

Two cases of carcinoma developing in gall bladder remnants are reported. The literature has been reviewed.

If it is impossible to remove the entire gall bladder due to technical or other reasons, patient should be re-operated on at an early date and the gall bladder remnant should be removed.

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2

Peptic Perforation in Childhood

C. N. KRISHNAMURTY*, J. K. BANERJEE**

Peptic perforation is extremely rare in childhood. In adults, its incidence rises sharply and it is said that 1 per cent of all ulcers in males present with perforation Nevertheless, this condition does occur once in a while in children and one such case is reported here.

CASE REPORT

A male child, A. S., aged 8 years, was admitted on 1-11-1972, in our hospital with sudden acute pain in the upper abdomen with vomiting and distension of one day's duration. A past history of sore throat, fever and joint pains of fifteen days' duration was elicited. He was being treated by physicians with antibiotics (including chloramphenicol) and cortisone during this period. When he developed sudden agonising pain, he was referred for admission to our hospital.

Examination revealed an anxious child with moderate dehydration and toxaemia. Pulse was rapid and feeble, blood pressure—80 mm. Hg systolic, the abdomen was slightly distended with guarding and tenderness all over. The tongue was dry and coated. Bowel sounds were infrequent. There was a slight swelling with tenderness around the right knee joint with predominant flexor spasm. A tentative diagnosis of enteric/tuberculous perforation was made and the patient was prepared for laparotomy.

Investigations—Blood examination revealed haemoglobin—9¼ g. per cent, PCV 29 per cent, total leucocyte count 28,000/c.mm. with polymorphs 95 per cent, lymphocytes—5 per cent. E.S.R. was 77 mm. in first hour. Temperature—37.6°C. X-ray of abdomen revealed massive gas shadows under the diaphragm.

Management—Exploration revealed a perforation in the anterior wall of the first part of the duode-

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num. There was no scarring or fibrosis around the margins thus suggesting perforation of an acute peptic ulcer. It was repaired and the abdomen was closed. Postoperatively, the patient developed wound infection which finally healed. Hectic temperature and flitting joint pains continued together with a raised ESR.

On the ninth postoperative day, he developed tender cutaneous nodules. ECG showed evidence of rheumatic myocarditis and on the thirteenth postoperative day, a diastolic murmur and thrill appeared on the mitral area of the heart. The physicians were consulted and oral salicylates started on the same day. He was also put on penicillin and erythromycin. In ten days his ESR (which has risen to 110 mm. postoperatively) gradually came down to 42 mm., his temperature settled and joint pains diminished. He was finally taken over by physicians, four weeks after the operation, for further treatment of rheumatic fever. Later, he was discharged from the hospital.

DISCUSSION

Up-to-date, 120 cases of peptic perforation has been described in the literature. Of these, 50 survived (Johnston and Rintoul, 1972). Various causes has been ascribed. Anoxic damage due to selective shunting of blood leaving relatively ischaemic areas in the gastro-intestinal tract is supposed to be one of the causes (Lloyd cited by Johnston and Rintoul, *loc. cit.*). Adverse emotional factors and stress due to disease is supposed to be another. We did not do a gastric analysis after the operation. That hypersecretion of acid is a predisposing factor in ulcer formation and perforation in children is yet to be established. Moreover, the results of gastric analysis in children have been felt to be unrealible by previous workers like Goldberg and Milliken (cited by Johnston and Rintoul, *loc. cit.*).

Awareness of this condition is essential for any surgeon handling neonates, infants and children In neonates and infants, the diagnosis is obscure and often made on *post mortem* examination only (Bhattacharya *et al.*, 1969). Enteric and tuberculous perforations are commoner in children, and peptic perforation does simulate one of these conditions clinically. Again, rheumatic fever is still a common condition in our country and cortisone is used extensively (and sometimes intensively) for the treatment of this condition. Problem arises as to whether one can continue using cortisone for the treatment of the parent disease in such a case after the repair of perforation. Withdrawal of cortisone in our patient produced a flare up of rheumatic activity which was controlled with difficulty. Cortisone is used by physicians for treatment of various diseases in children and one should remember that it can cause peptic perforation in them too.

SUMMARY

A case of peptic perforation in a child of 8 years is presented. The problems of its diagnosis and management are discussed.

ACKNOWLEDGMENT

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3

Adenoma of the Lingual Thyroid

B. MOHANTY*, L. J. deSOUZA**
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Tumours of the lingual thyroid were first described by Verneuil in 1853. These occur as solid tumours, usually in women, exactly in the midline of the tongue. Pathological complications, like goitres, haemorrhages and hypertrophy leading to dysphagia, dyspnoea, and speech defects, have been described. Zehner (quoted by Joll, 1940) noted symptoms of hypothyroidism in a few but hyperthyroidism in only one case. Wood (1916) and Harvey (1925) have quoted the association of a foetal adenoma of the lingual thyroid with mental deficiency in three girls. Malignant transformation of the lingual thyroid has been recorded by Ashhurst and White (1925). A pure adenoma of the lingual thyroid is a rarer entity and has been poorly documented.

CASE REPORT

Mrs. P. R. G., aged 30 years, attended the Tata Memorial Hospital on 2nd November 1970, with complaints of a swelling on the posterior third of the tongue for 1½ years, which had been gradually growing. She had difficulty in deglutition and noticed a speech defect for one month. There were no signs or symptoms of hypo or hyperthyroidism.

Clinical examination—On clinical examination a solid, nodular, tender swelling, 3 cm. × 2 cm. in size

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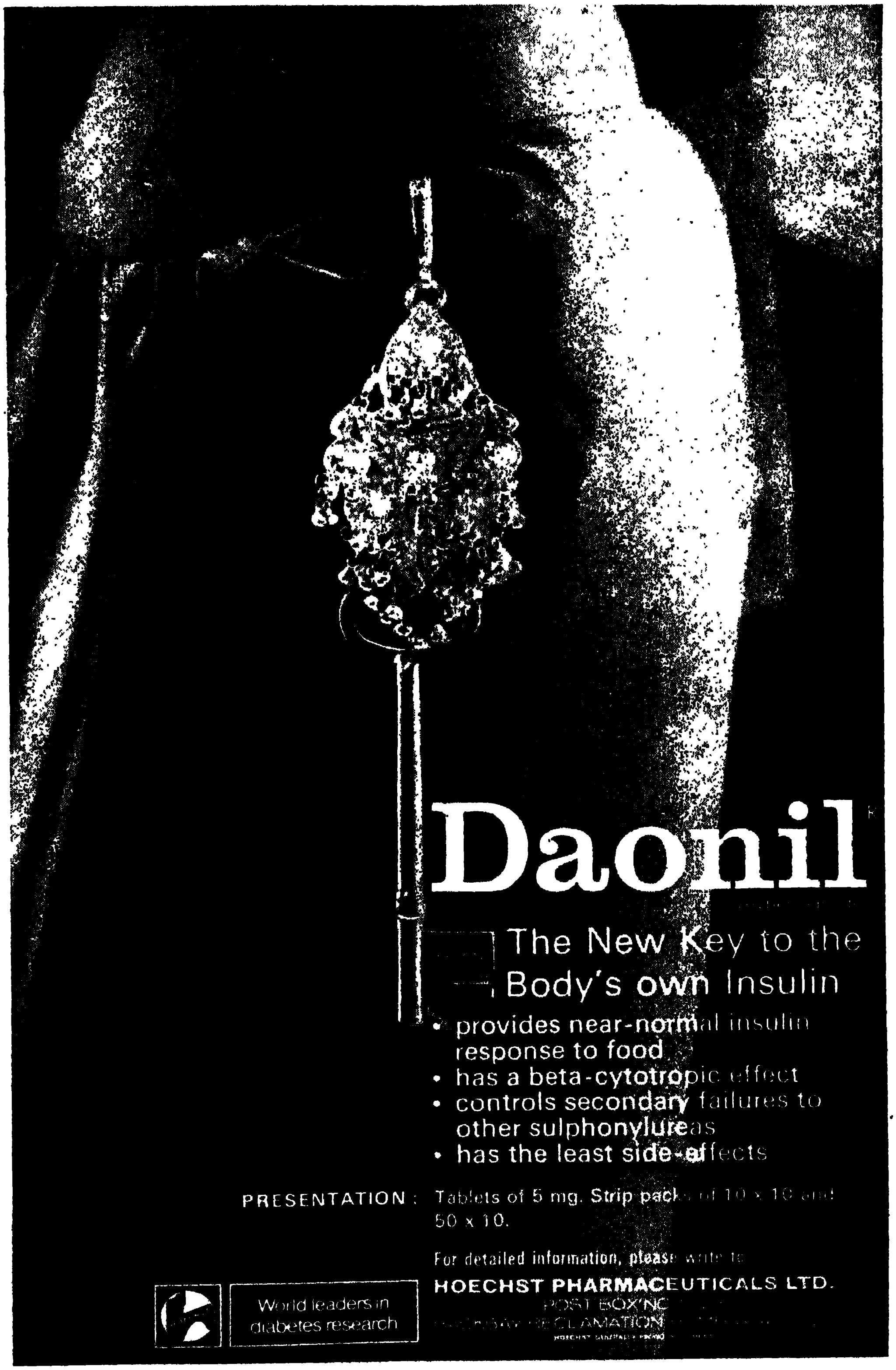

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was felt at the junction of the anterior 2/3rd with the posterior 1/3rd of the tongue. It was covered with an intact mucous membrane. No regional lymph nodes were palpable. Systemic examination revealed no abnormality.

Investigations—Routine blood investigations were normal. The ECG showed no abnormal changes.

The chest x-ray was clear and a barium swallow examination showed a rounded mass at the base tongue pushing the epiglottis downwards.

An I^{131} radio-active scan showed entire concentration in the lingual swelling with total absence of concentration in the neck.

Operative procedures—She was taken-up for surgery on 24th December 1970. A preliminary tracheostomy was followed by bilateral ligation of the lingual arteries. The swelling was then excised by splitting the tongue. An immediate frozen section examination showed an adenoma of the lingual thyroid and hence implantation was not performed. Histopathological examination revealed varying sizes of acini, some containing colloid material (Fig. 1, H & E × 280). Stratified epithelium, mucus secreting glands and normal thyroid gland tissue deeper to these were also noted (Fig. 2, H & E × 21).

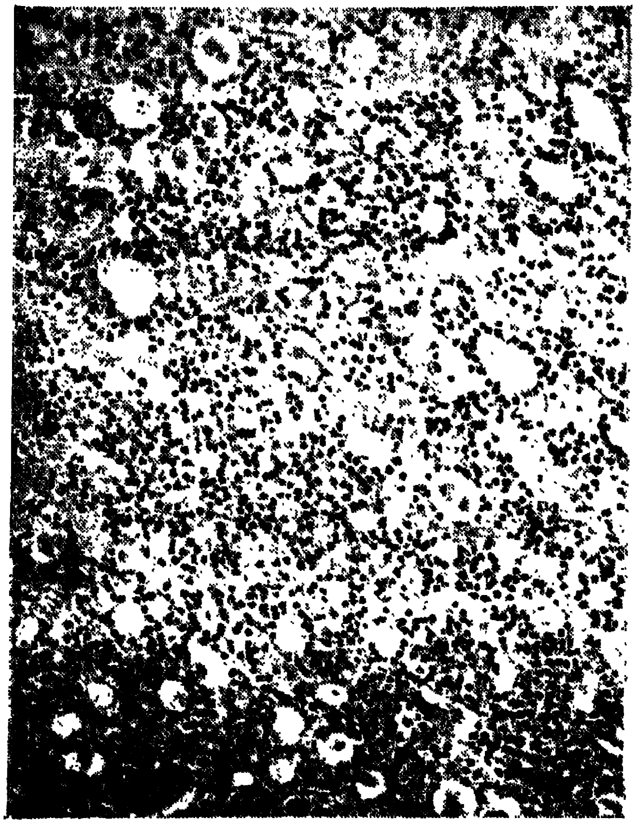

Fig. 1

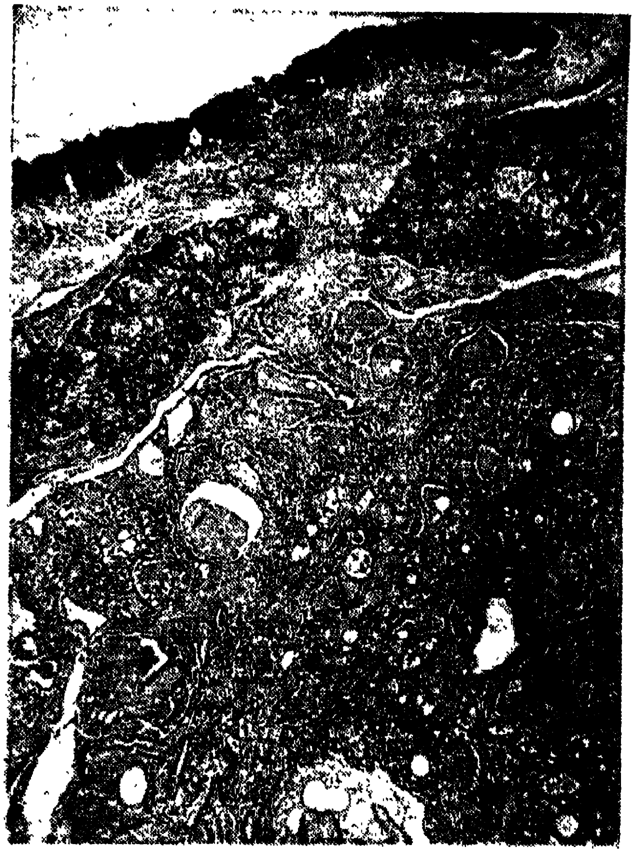

Fig 2

The postoperative period was uneventful and the tracheostomy tube was removed on the 7th postoperative day. The patient was discharged on the 14th postoperative day and advised to take tablet thyroxine sodium 0.1 mg., three times a day. At a recent follow-up examination she was found to be quite well.

DISCUSSION

Complete arrest of the descent of the thyroglossal duct is a rare phenomenon. Thus the incidence of a lingual thyroid is 1 in 4000-5000 of all thyroid diseases. (Baker and Szanto, 1961; Turcot, 1962; Ray, cited by Gupta, 1966).

It was found that a preliminary tracheostomy facilitated safe intratracheal intubation for the administration of general anaesthesia and proved helpful in postoperative management. Bilateral ligation of the lingual arteries certainly prevented troublesome haemorrhage during surgery of the base tongue.

A frozen section examination in such cases can help in preventing implantation of malignant or potentially malignant tissues. Besides, implantation of lingual thyroid tissues is no longer a necessary procedure with the availability of cheap thyroid substitutes.

SUMMARY

An uncommon case of adenoma of the lingual thyroid has been presented.

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4

Spontaneous Annular Detachment of Cervix During Labour

NISHITH GHOSE*, KALYANI ROY**

Spontaneous annular detachment of the cervix during labour is a very rare complication. According to Greenhill (1960) about 60 authentic cases have been so far reported. Such a case has been stated to be first reported as early as 1821 (Ingraham and Taylor, 1947). We present one such case that occurred in Chittaranjan Seva Sadan, Calcutta.

CASE REPORT

A 21-year-old primigravida, carrying 39 weeks, was admitted in labour for about 6 hours as an emergency case on 16-9-1971 at 11 P.M. Her built was average and there was no oedema or clinical evidence of anaemia. Pulse, temperature and blood pressure were normal. The uterus was term size, uterine contractions were weak at 10 to 12 minutes interval, lasting for about half a minute. Relaxation was complete. Vertex was presenting, deflexed, with both the poles palpable per abdomen; but there was no overlapping Foetal heart sounds were audible 140/minute, regular. On pelvic examination, the cervix was found completely effaced, 2 fingers loose with soft dilatable margin. Membranes were present flat over the head, lowest point of which was about ½″ above the level of the ischial spines. The pelvis was found adequate for the head. The patient had enema simplex followed by potbrom chloral mixture.

The patient had a quiet night but contractions did not improve.

At 9 A.M. on 17-9-1971 (10 hours after admission) she was found somewhat restless. General condition was good, pulse—86/minute. She was having moderately strong uterine contractions at 10 minutes interval, lasting for about half a minute and relaxation was good. The vertex was unengaged and foetal heart sounds were good and regular, 148/minute. Pelvic findings were same as before. She was given 100 mg. pethidine hydrochloride, intramuscularly.

Condition of mother as well as that of the foetus remained well but the labour was not progressing satisfactorily. As the patient grew restless, 100 mg. pathidine hydrochloride, intramuscularly was repeated after 6 hours at 3-15 P.M. and 5 per cent dextrose intravenous drip was started.

At 9 P.M. (22 hours after admission), the patient again became restless; pulse—100/minute, temperature—99.4°F. Uterine contractions were moderately strong at 7 to 8 minutes interval with complete relaxation in between. Both the poles of the head were palpable abdominally and foetal heart sounds —146/minute, regular. Pelvic findings were same as before excepting that the cervical lips were oedematous. The membranes were ruptured artificially draining about 3 oz. of clear liquor amnii. Intravenous fluid was continued and sedative (50 mg. pethidine hydrochloride with 50 mg. promazine hydrochloride, intramuscularly) was repeated. The patient was kept under close observation. Foetal heart rate remained good but labour did not progress and maternal pulse rate was gradually increasing.

At 5-30 A.M. on 18-9-1971 (31 hours after admission) the pulse rate was 120/minute. Vertex was found engaged and uterine contractions were as before. Foetal heart rate was 168/minute. On pelvic examination the cervix was found oedematous, os admitting 2 fingers just. A small rent could be felt in the anterior wall of the oedematous cervix. Lowest bony point of the vertex was at the level of the ischial spines. A small caput had formed. Caesarean section was decided and the patient was transferred to the operation theatre.

During catheterisation before operation, a dark red fleshy mass was discovered near the vaginal introitus. On being taken out the mass was recognised as the detached annular portion of the cervix. There was no vaginal bleeding. A vaginal examination was done under general anaesthesia. The cervix appeared fully effaced and fully dilated. Vertex was engaged in L.O.T. position. There was no bleeding from the cervical margins. Forceps delivery after manual rotation of the head and left lateral episiotomy was without difficulty. Placenta and membranes were expelled spontaneously. There was no undue hae-

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morrhage. A male baby weighing 5 lb. and 14 oz. was born in good condition. Total duration of labour was about 38 hours.

The puerperium was absolutely uneventful and the patient was discharged on the 12th day with advice to return for postnatal examination after a fortnight. Unfortunately the patient did not turn up.

The specimen—The detached cervix is dark purplish in colour. The broader proximal end is about three and a half inches in diameter and the external os was just two fingers dilated. The length of the detached cervix was about two inches (Fig. 1).

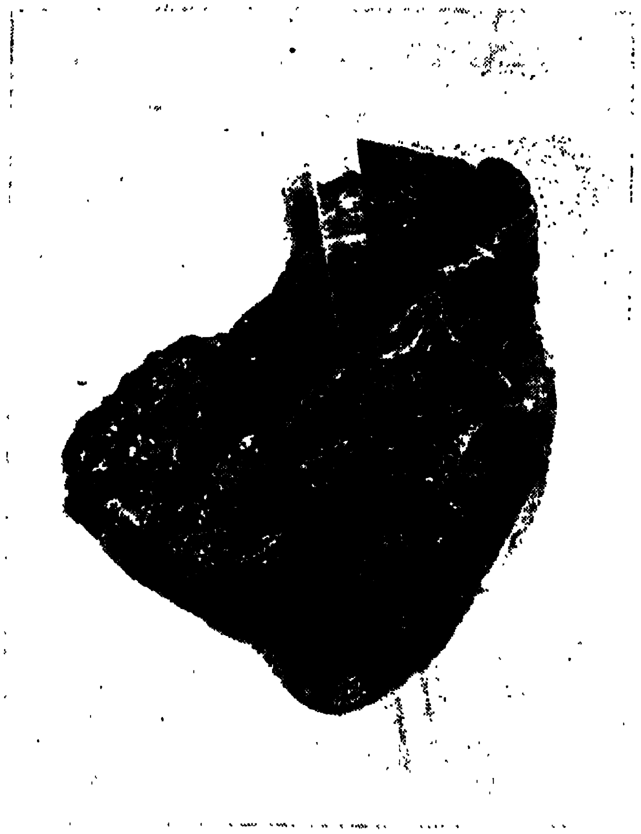

Fig. 1—Showing the detached cervix

Histology—The section shows engorgement of blood vessels and extravaseted blood in the surrounding tissue with leucocytic infiltration. No muscle tissue is present. Very scanty fibrous tissue is present here and there but practically they are structureless. The line of cleavage shows necrotic tissue.

DISCUSSION

Ingraham and Taylor (*loc. cit.*) have analysed 55 cases including one of their own and from their analysis excluded 2 cases, one of which occurred at the time of a 2-month abortion and the other was complicated with carcinoma of the cervix. The exclusion of the last case has led Jeffcoate and Lister (1952) to question the use of the term "spontaneous", which they prefer to avoid.

This is essentially a complication of primigravidae, though it may occur in multigravidae if the cervix is fibrosed as a result of previous surgical or obstetrical trauma. Seventy-five per cent of the cases as analysed by Ingraham and Taylor (*loc. cit.*), occurred in primigravidae. Five out of 6 cases reported by Jeffcoate and Lister (*loc. cit.*) were also primigravidae. In the remaining case parity was not known Uhma (1949) and Arnott (1949) reported a case each in primigravidae. The present patient was also a primigravida.

The average age in the analysis of Ingraham and Taylor (*loc. cit.*) was 31 years, suggesting many were elderly. In the case reported by Uhma (*loc. cit.*) the patient was 36 years old but that of Arnott (*loc. cit.*) was young as well as that in the present report.

The presentation is almost always vertex. In 2 of the analysed cases of Ingraham and Taylor (*loc. cit.*) foetuses presented by breech. But in these 2 cases along with another 3 with vertex presentation, a hydrostatic bag had been introduced to assist cervical dilatation.

Cephalopelvic disproportion was present in 25 per cent of the cases reviewed by Ingraham and Taylor (*loc. cit.*). Munro Kerr and Chassar Moir (1949) have referred to a case described by Hewitt with disproportion. Jeffcoate and Lister (*loc. cit.*) do not consider disproportion as an aetiological factor. According to them the presenting part will not be firmly applied to the cervix when there is disproportion, which tends to hang loose. Further the fit of the head is never so accurate that the cervix could be uniformly compressed on all its aspects, essential for annular as opposed to localised or partial detachment of the cervix. They also rule out uterine inertia and incoordinate uterine action as aetiological factors. They blame cervical rigidity as the sole cause. According to their observations, strong coordinated uterine contractions, effacing the cervix, drives the foetal head down, which is low, suggesting a roomy pelvis, against the external os, which resists dilatation. The cervix remains thin and free from oedema. Arrest or impairment of circulation results from counter pressure of the presenting part against the cervix leading to necrosis. Premature expulsive efforts may be a contributing factor. They consider that cervical dystocia is due to fault in the preparatory process rather than to a structural anomaly. But according to Munro Kerr and Chassar Moir (*loc. cit.*) some abnormal structural condition of the cervix is an important cause.

On the other hand Munro Kerr and Chassar Moir (*loc. cit.*) have quoted DeCosta, who has concluded from his review of 17 cases that such complication of labour is dependent on some degree of foeto-pelvic disproportion, early rupture of membranes and possibly a long cervix. According to him, pre-existing rigidity of the cervix may be a factor but probably is less important than so long stressed.

Early rupture of membranes have been reported in 48 per cent of the cases reviewed by Ingraham and Taylor (*loc. cit.*). But Jeffcoate and Lister (*loc. cit.*) have reported cases when the membranes did not rupture early. In one of their cases separation of the cervix had probably started before the membranes had ruptured. In the present case also there was no early rupture of membranes.

Though the present case does not conform in details to the observations of Jeffcoate and Lister (*loc. cit.*) and other authors, no doubt, some abnormal mechanism of labour was in force with unyielding cervix. Persistent spasm of the lower uterine segment meaching to the crown of the head, as may occasionally occur (Lindgren and Smyth, 1961) might had been present also. Prolonged pressure of the head on the cervix undoubtedly was the cause of obstruction to circulation and subsequent devitalisation and detachment.

All reports agree that there is no undue haemorrhage from the cervical margins as the vessels become thrombosed.

The 4 maternal deaths reported by Ingraham and Taylor (*loc. cit.*) were due to puerperal sepsis which can be prevented nowadays by prophylactic antibiotic. Later authors do not report any material death excepting one by Jeffcoate and Lister (*loc. cit.*). That was due to bilateral suprarenal haemorrhage, possibly the effect of prolonged labour.

Ingraham and Taylor (*loc. cit.*) have reported 29 per cent foetal loss. Foetal loss is possibly due to prolonged labour and not due to any difficulty in the ultimate delivery.

SUMMARY

A case of spontaneous annular detachment of the cervix in a young primigravida is presented. The labour was prolonged, the membranes did not rupture early and there was no cephalopelvic disproportion. Forceps delivery was not difficult after detachment of the cervix and there was no undue haemorrhage from the cervical margin. Recovery of both mother and baby was uneventful.

The literature has been reviewed.

ACKNOWLEDGMENT

The authors are grateful to Dr. S. G. Ghosh, Director, Chittaranjan Seva Sadan, Calcutta for his kind permission to publish the case record and to Dr. T. K. Ghosh, Principal, for his encouragement and inspiration. Thanks are also due to Dr. Diptendu Mukherjee of the Pathology Department and to Shri Souren Bose for preparing the typescript.

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5

Idiopathic Gangrene of Scrotum

M. P. RAVINDRANATHAN*
T. T. THOMAS**

Idiopathic scrotal gangrene was first described by Fournier in 1884 and since then there have been occasional case reports. In view of the paucity of such reports in Indian literature, we feel the present case merits documentation.

CASE REPORT

A male, aged 48 years, was admitted to District Head Quarters Hospital, Ernakulam in February, 1972 with three days' history of sudden onset of fever, headache and malaise. On the day of admission he noted a tender erythematous swelling of the scrotum and lower part of the anterior abdominal wall. He was quite healthy all through his life before and had never undergone any surgical procedures in the genital or perianal region. There was also no history of trauma to the scrotum.

On examination, he looked very ill and toxic with a temperature of 102.6°F. The scrotal skin was severely inflamed on the right side and was gangrenous on the left side where in places it had sloughed away to expose the testis. The anterior abdominal wall above the pubic symphysis was also inflamed and gangrenous and the removal of the slough exposed a large irregular ulcer beneath the deep layer of superficial fascia (Fig. 1).

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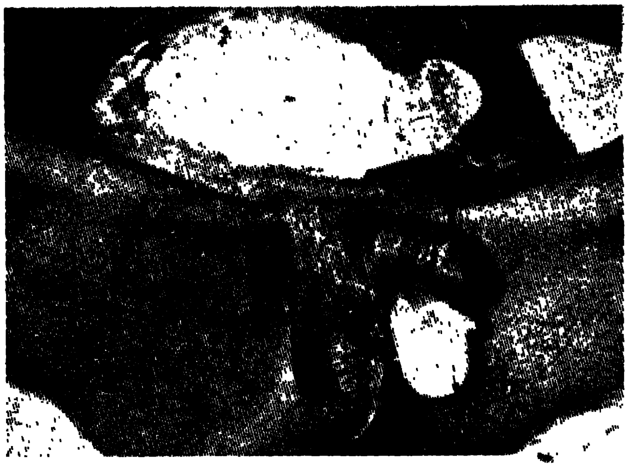

Fig. 1

Investigations—Hb.—12.5 g./100 ml., Total W.B.C. count—12,400/c.mm. with polymorphs—82 per cent, lymphocytes—16 per cent and eosinophils—2 per cent. ESR—120 mm./hour (Westgren). Urinalysis—N.A.D., Fasting blood sugar—105 mg. per cent and post-prandial blood sugar—140 mg. per cent.

Culture of mid stream specimen of urine was negative. A swab from the scrotal skin showed plenty of pus cells and on culture revealed *Streptococcus haemolyticus* sensitive to penicillin. Microscopic examination of scrotal tissue revealed necrosis and marked infiltration with polymorphs and obliterative arteritis of a few arterioles.

Treatment and progress—Under general anaesthesia the necrotic skin and slough of the scrotum and anterior abdominal wall were removed. He was then put on Injectio crystalline peincillin 1 mega unit 6 hourly during the first 5 days then reduced to 1 mega unit 8 hourly during the next 5 days. One pint of 'B' group blood was given on the first day because of his severe toxaemia. The condition of the abdomen and scrotum improved with daily dressings. After four weeks the scrotum and abdominal wall were completely covered with granulation tissue and by the end of 8 weeks the scrotum was healed well. The skin of the anterior abdominal wall was restored with a split skin graft.

COMMENT

The three cardinal features of Fournier's gangrene (Bailey and Love, 1965) are: (1) Sudden appearance of scrotal inflammation in the midst of apparently good health, (2) rapid onset of gangrene and (3) the absence of any cause in over half the cases. In a review of 16 cases, Randall (1920) found that six had local lesions which may have acted as a portal of entry of the causative organisms. Thomas (1956) observed that the condition could be secondary to such lesions as balanitis, chancroid or minor abrasions in the genital region and it can also occur after operative procedures like circumcision, herniorrhaphy, incision of perirectal abscess and injection of a hydrocele. Recently a case of scrotal gangrene following vasectomy has been reported (Pryor *et al.*, 1971).

Our case illustrates all the characteristics of Fournier's gangrene with the explosive onset of toxaemia and the rapid onset of gangrene in the scrotum and anterior abdominal wall in a previously healthy individual. The condition is very uncommon. At first only the scrotum is involved; if not treated promptly the cellulitis may spread to the penis or up the abdominal wall; extension follows the same lines as in extravasation of urine. The mortality rate used to be about 30 per cent before the introduction of chemotherapy (Randall, *loc. cit.*) but now the condition is amenable to treatment with suitable antibiotics and usually the resolution is rapid. The scrotal skin heals quickly and there is no need for skin grafting although a large gap in the abdominal wall may require skin grafting as in the present case.

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6

Replacement Lipomatosis of the Kidney

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Lipomatosis of the renal parenchyma is an uncommon condition and is rarely diagnosed pre-operatively. It occurs concomittantly with many inflammatory and noninflammatory conditions and has to

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be differentiated from perirenal and intrarenal lipomas. Almost always, the condition is unilateral and no adequate hypothesis has been put forward for its rare bilateral occurrence.

Reports on this condition from India are rare (Reddy *et al.*, 1962) and as we had occasion to study two cases of unilateral renal lipomatosis, we are presenting them in detail.

CASE REPORTS

Case 1—K, a one-year-old male child, was admitted on 10-7-1968 with history of a mass in the right side of the abdomen of 3 days' duration. The child had fever preceding this. There was no history of haematuria or pyuria.

On examination, the child was found to be anaemic, ill nourished and dehydrated. The blood pressure was 110/70 mm. Hg. and the temperature was 99°F. An intra-abdominal mass measuring 7″ × 4″ occupying the right lumbar region and right hypochondrium was found. There was a globular projection of the mass in the right loin.

Investigations—Microscopic examination of the urine showed pus cells and a few red blood cells. Blood urea was 39 mg. per cent. Total leucocyte count was 12,800/c.mm. with neutrophils—62 per cent lymphocytes—32 per cent and eosinophils—6 per cent. Haemoglobin was 6 g. per cent. I.V.P. showed a normal left kidney. The right kidney, pelvis and calyces were displaced and stretched. The appearance was consistent with a right kidney tumour and the child was operated on 18-7-1968.

Management—At operation, the mass was located posterior to the right kidney with dense adhesions. The anterior surface of the kidney was normal. While separating the adhesions, the mass was punctured at one point and thick yellowish pus came out under force. A diagnosis of suppuration of the kidney complicated by perinephric abscess was made and the kidney was removed.

Pathology—The specimen measured 7 × 4 cm. and weighed 80 g. The capsule appeared thickened in areas. There was loss of corticomedullary demarkation and the entire cut surface showed yellowish white patchy areas (Fig. 1).

Microscopic sections showed inflammatory reaction involving mainly the pelvis and the medulla of the kidney with predominant plasma cells and lymphocytes and collections of lipophages with foreign body giant cell reaction (Fig. 2). There were also areas of fibrosis. The glomeruli, tubules, and vessels did not show any pathology except exudate in some of the tubules. The findings were consistent with replacement lipomatosis of the kidney secondary to pyelitis.

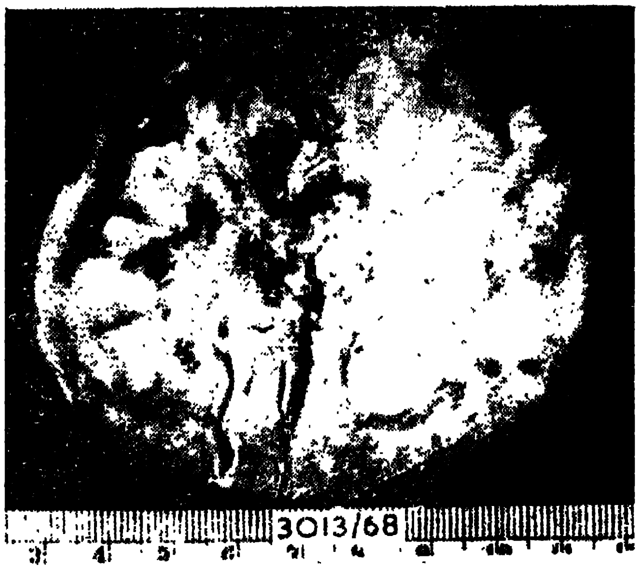

Fig. 1—Showing the cut surface of the kidney with extensive areas of replacement by fat

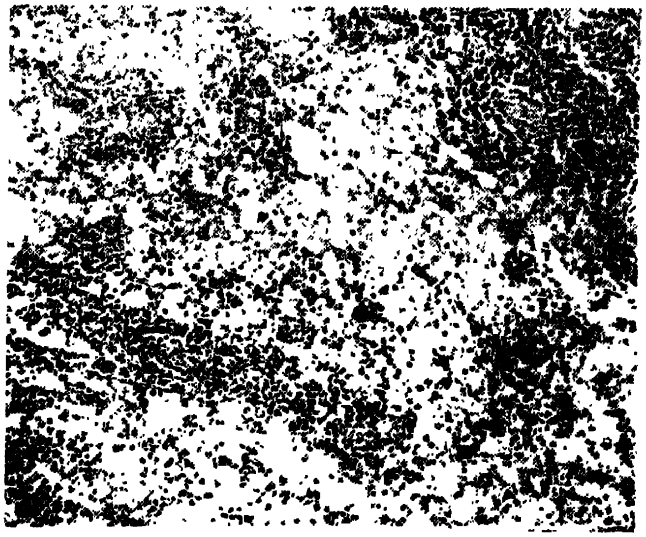

Fig. 2—Showing the lipophages with chronic inflammatory cells

Case 2—Mrs. P, a 40-year-old female, was admitted with a history of a sinus in the left loin of 6 months' duration. It started as a swelling which burst developing into a sinus, discharging pus.

Investigations—Plain x-ray abdomen showed a calculus in the left renal region and I.V.P. showed a nonfunctioning left kidney. Retrograde pyelography and cystoscopy showed a normal bladder with congestion of the left ureteric orifice. Sinogram was not informative. At operation, the left kidney was found to be completely replaced by fatty tissue and was very adherent all around. There was no distinction between perinephric fat and the kidney substance which could not be identified at all. An abscess cavity was found occupying the place of renal pelvis containing a calculus and communicated with the sinus.

Pathology—The specimen showed mainly fatty tissue and no kidney tissue could be made out even by a thorough examination. The mass weighed 180 g. and measured 9 × 7 × 5 cm.

The cut section also showed mainly fatty tissue with areas of fibrosis. Multiple microscopic sections had to be studied for detection of the residual kidney tissue which was seen as groups of renal tubules surrounded by fibrofatty tissue with chronic inflammatory reaction and lipophages (Fig.3).

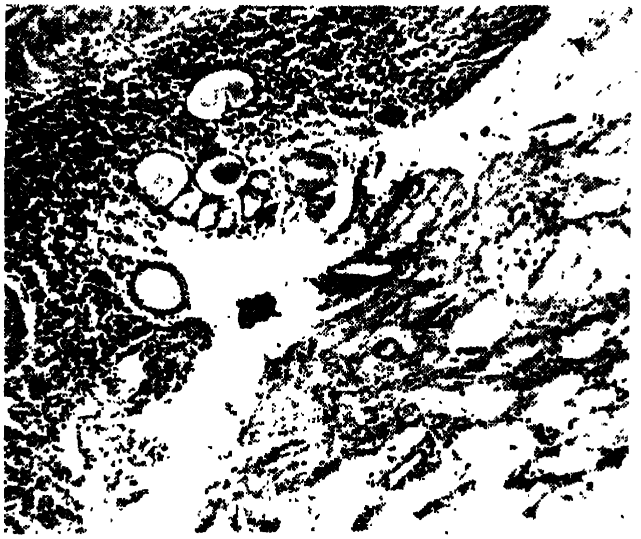

Fig. 3—Showing a group of renal tubules surrounded by lymphocytes and fibrofatty tissue

DISCUSSION

Conditions commonly associated with replacement lipomatosis are pyelonephritis, renal calculi, tuberculosis and non-inflammatory conditions as nephrosclerosis, arteriosclerosis, amyloidosis, chronic glomerulonephritis and hypernephroma. The concept of replacement of the kidney with a slight increase of fat to an almost complete replacement was introduced by Roth and Davidson (1938). The presence of calculi was stressed by many workers like Kutzman (1931), and also by Kreel *et al.* (1966) who found renal calculi in three of his four cases. The pathological growth of fatty tissue in the kidney is influenced by the general state of body nutrition (Ham and de Veer, 1939; Windholz, 1951) and some were even associated with obesity (Kreel *et al.*, loc. *cit.*).

In a small minority of cases of replacement lipomatosis the fibrofatty tissue occurs in the absence of any associated infection or is greatly in excess of the severity and duration of the disease. These cases are labelled as primary lipomatosis of the kidney. The pathogenesis remains unknown. Acute ureteric obstruction is shown to produce seepage of urine through pyelosinus space into the renal hilus and retroperitoneal tissue (Ginsberg, 1965). There is an inverse relationship between replacement lipomatosis and hydronephrosis, as in the latter the pyelosinus space becomes sealed and there is seepage of urine (Young, 1933). Kreel *et al.* (*loc.cit.*) is of opinion that a renal infection leading on to protein seepage into the hilus with formation of fibrofatty tissue may cause blockage of lymphatics which may enhance the existing pathology.

Both of our cases come under the category of secondary renal lipomatosis. As the average age incidence reported is 46 years, our first case of a boy aged 1 year appears to be the youngest age so far recorded.

SUMMARY

Two cases of replacement limpomatosis of the kidney in a one-year-old boy and a 40-year-old woman are reported and the relevant literature is reviewed.

ACKNOWLEDGMENT

We wish to thank Dr. M. Balasubrahmanyan, Principal and Head of the Department of Pathology for allowing us to publish these case reports.

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Dadheechi's Legatee

The name of *Dadheechi* or *Dadheech* is notable in Indian mythology. He was born of the sage *Atharva* and his consort *Shānti*. He sacrificed his life in meditation so that after his death a very powerful weapon could be shaped out of his bones for the destruction of the notorious demon *Bṛttrāsurā*.

In the history of modern medicine the names of people sacrificing their lives while experimenting for new inventions and discoveries are not in abundance. In the field of roentgenology the sacrifices are in the maximum. Very few of us remember to-day the names of the German radiologist Albers-Schönberg (1865-1921), the French radiologist Bergonié (1857-1925) and the Austrian radiologist Holzknecht (1872-1931), all of whom died of the ill effects of excessive exposure to *x*-rays during experimentations. One must also recall the name of the Japanese bacteriologist Noguchi who contacted and died of yellow fever while doing experiment on the disease. We should gratefully remember those immortals on whose sacrifices modern medicine has progressed so far.

In 1929, a German urologist and physician named Frossmann[1] made a spectacular and dangerous experiment on himself. He introduced an ureteric catheter into one of his cubital veins and guided it along till it reached his right atrium. Thus he paved the way for the future radiological technique of angio-cardiography and various manometric studies on the circulating blood. As usual he was ridiculed and humiliated for the adventure, but after long years of patient waiting he was rewarded with a Nobel prize in 1956.

Since the advent of modern medicine in India we have only emulated the textbook teachings of the occidental trends in medicine. We have progressed fairly well in the clinical and practical aspects but our contribution to experimental medicine is not worth mentioning. We have never heard of any Indian medical scientist who has made a comparable sacrifice excepting the one whose article on self-inflicted cutaneous nerve injuries is published elsewhere in this issue[2]. The scientist in question severed his own lateral femoral cutaneous nerves under local anaesthesia and described his subsequent experiences on the sensory disturbances. This is possibly the first ever documented self-experiment performed in India.

Preceding the above individual, various other western authors[3]—[6] have also divided and sutured the cut ends of one or more cutaneous nerves in themselves. Then they closely followed the sensory status during the period of recovery. One group of workers[7] described that the changes consequent upon depriving a piece of skin of its nerve supply are distributed in a sensory area of absolute loss, surrounded by a zone of much less loss which is more pronounced centripetally than centrifugally. It is obviously due to the overlapping of sensory zones. They also stated, that on sensory stimu-

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[1] SCHINZ, H. R.—Sechzig Jahre Medizinische Radiologie., 1959, George Thieme, Stuttgart.

[2] SEKHON, G. S.—*J. Indian, M. A.*, 61: 123, 1973.

[3] RIVERS, W. H. R. and HEAD, H.—*Brain*, 31: 323, 1908.

[4] BORING, E. G.—*Quart. J. Exp. Physiol.*, 10: 1, 1916.

[5] SHARPEY-SCHAFFER, E.—*Ibid.*, 19: 85, 1928.

[6] LANIER, L. H., CARNEY, H. M. and WILSON, W. D.—*Arch. Neurol. Psychiat.*, 34: 1, 1935.

[7] TROTTER, W. and DAVIES, H. M.—*J. Physiol.*, 38: 134, 1909.

lation an alteration in the quality of sensation is found at the termination of the second week after the injury. This change lasts for about six to eight weeks. Gradually a stage of hyperalgesia ensues in the area of hypalgesia. The said hyperalgesia is very unpleasant. Pain sensation in the intermediate zone is qualitatively altered. The threshold to the painful stimulus becomes very much higher than the normal but once the magnitude of the stimulus exceeds the threshold, the pain is felt in high intensity and with added unpleasantness. This variation of pain sensation is also observed in the central anaesthetic zone during regrowth of the cut nerve. Head[8] noted that the awareness of poorly defined pain returned to his denervated skin before the return of the sensation of touch. Such phenomenon may be encountered in neurosurgical practice. It has been observed by many neurosurgeons that after surgical interruption of the trigeminal nerve for the cure of trigeminal neuralgia the patient may complain of a very unpleasant sensation in the area of denervation even though no sensory nerves are functionally existant. The above phenomenon can only be explained by Head's concept of protopathic sensibility. In the experiments made by the present author[2] the nerves were severed under local anaesthesia and were not sutured. So, the experiments fundamentally differed from the experiments of the western scientists. The author had also induced a few of his colleagues to undergo local anaesthetic blocks of the nerves and has also documented their personal feeling.

The modest author has not staked any claim of an invention or discovery but one must commend his courage as he has really researched into the facts already found out by others.. In science searching and researching of established facts may sometimes reveal many unobserved spots in the penumbra of knowledge. So, we must offer him our sincere *kudos* saying "It is the effort that matters not the applause".

ASOKE K. BAGCHI

Generic *versus* Brand Names

The physician in India today enjoys complete freedom to choose his method of prescribing. Generic prescribing in the form of a mixture containing several ingredients used to be a routine over 2 decades ago. Medical students are taught the art of prescribing by generic names. After graduation, he acquires by self-education adequate knowledge of brand preparations. With the greater availability of brand preparations in the course of years, the style of prescribing has gradually drifted to brand names.

The question arises—Is such a shift in the style of prescribing in the right direction ?

Multiplicity of pharmaceutical manufacturers with the therapeutic sophistications has resulted into an innumerable products available having similar therapeutic effect. For example, there may be 50 different brands of antacids and 20 of diuretics, each one claiming some superiority. Such a situation makes medical practice, teaching and publications more difficult. Any suggestion to simplify this should be most welcome; provided it does not affect the therapeutic potentials of the drug. Generic prescribing is suggested as a measure but it may create problems more than it would solve. Therapeutic efficacy does not entirely depend upon the chemical constituent but the bio-availability of the drug plays an equal role.

An argument is often put forward by the politicians and Governmental controlling authorities that the generic prescribing will be much more economical and the drugs will be available to the public at large at such cheaper rate. Perhaps this is the way of eliminating the existing

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[8] **HEAD, H.—Quoted by Finneson, B. E. in Diagnosis and Management of Pain Syndromes, 1969, Saunders, Philadelphia.**

pockets of pharmaceutical empire in the country today. The proposal has received support from a few of the medical administrators with non-clinical background, but almost all the clinicians have rejected it.

The rejection is based on the following arguments:

1. Legislative enforcement of generic names on the products and prescriptions will lead to the deterioration in the quality of products, as the cost of manufacturing will have to be kept at its lowest. Proper checks for bio-availability of drugs from different manufacturers and different batches of the same manufacturer will not be possible by the drug control authorities.
2. It may create new problems in writing and dispensing of prescriptions. It is not possible for the physician to write all the specifications of physical and chemical characteristics of a drug in the prescription.
3. The desired economic advantage may not accrue but newer channels of profit motives may be created, with the result that the public will get inferior material at the same price.
4. Purification and refinement of the drug will be in the lacking. Impurities in the marketed products may provide allergens and new area of iatrogenic diseases may be created.

Apart from the price of the product marketed in India, what about the position of Indian pharmaceutical industries which will bear the brand names ? The pharmaceutical industries in India have grown over 30 times after independence and it is now earning considerable foreign exchange. We can hardly afford to lose this. If the brand names are abolished, it can be a tremendous blow to the pharmaceutical production and exports.

Generic non-equivalence affects in several ways.

In giving an anti-hypertensive drug, the aim is to reduce the blood pressure and the dose has to be adjusted on the response of the patient. If generic substitute drug of the same or the other manufacturer, having non-equivalent availability is started, the blood pressure will naturally not be controlled. Such a situation usually may not lead to any serious consequence.

On the other hand, antibiotics are given generally in a fixed dose and the effect is measured by recovery from the infection. If a generic substitute has a low bio-availability, it can lead to serious consequences. Pharmacies of large hospitals, governmental or paragovernmental agencies invite tenders for drugs by generic names and select the lowest as far as possible. These agencies have to rely on the reputation of the suppliers for the equivalence in bio-availability of their products.

Thus it is extremely important to maintain the uniform equivalence of bio-availability of various drugs.

Pharmaceutical industry would naturally insist on retaining brand names. Unless the manufacturer receives fair returns for the development of a particular drug by patent rights, there is no incentive to innovate any drug for the manufacturers. After the expiry of the patent rights, other manufacturers must produce data to prove the bio-availability as good as that of innovator's drug.

Uniformity has to be maintained not only in the products of different manufacturers but also in batch-to-batch products of the same manufacturer. Such standards can be afforded by only large companies.

Considering the pros and cons of generic *versus* brand names, let the choice of prescribing be left with the prescriber. In any case, if the ratio of efficacy to toxicity is to be uniformly maintained at its optimum, therapeutic equivalence of the drug has to be maintained. It may be advisable to prescribe some drugs by generic names, while other drugs are better prescribed by brand names.

SHANTILAL SHAH

CURRENT MEDICAL LITERATURE

Acute Haemophilic Haemarthroses and Muscle Haematomata

LURIA, A. and BAILEY, B. P. (*S. Afr. Med. J.*, **46**: 656, 1972) from the Department of Haematology, School of Pathology, University of the Witwatersrand and the South African Institute for Medical Research; and the Department of Physiotherapy, Transvaal Memorial Hospital for Children, Johannesburg, write:

A practical guide to the management of acute haemarthroses and muscle haematomata occurring in haemophilia and Christmas disease is described. The scheme of rapid infusion of plasma or plasma concentrates, immobilisation and rehabilitative physiotherapy, aims to stop the haemorrhage, relieve pain, preserve joints and muscles, and restore them to a state of optimum function. In this way it is hoped to shorten convalescence, prevent the crippling deformities that previously were an inevitable consequence of the disease, and to reduce absenteeism from school or work.

Haemophilia and Christmas disease are the most commonly occurring of the inherited bleeding disorders. The former is due to a functional deficiency of the coagulant protein termed factor VIII, and the latter to a functional deficiency of another coagulant protein, factor IX. The commonest lesions experienced by haemophilic patients are haemorrhages into joints (haemarthroses) or muscles.

The aims of treatment are to relieve pain, prevent recurrence of bleeding and preserve the joint in a state of optimum function. Management can be considered under the following headings:

i) Fresh plasma (FP) and frozen fresh plasma (FFP). ii) Cryoprecipitate (Cryo) prepared from fresh human plasma. iii) Commercial factor VIII/IX freeze-dried human plasma concentrates.

The role of aspiration is controversial. The advantages are obvious—to remove the large amount of blood present in the joint, and thereby relieve pain and permit rapid mobilisation. Aspiration should be accompanied by an infusion of frogen fresh plasma (FFP) or cryoprecipitate prepared from fresh human plasma (Cryo), otherwise blood will re-accumulate in the joint.

Immobilisation is important in the management of an acute haemarthrosis for 2 reasons: (i) Movement of the joint is extremely painful and will be prevented by a correctly applied splint; (ii) if the joint is not immobilised in as near the functional position as is possible (e.g., maximum extension of the knee, 90 per cent flexion of the elbow), fixed deformities may occur due to spasm of the flexor muscles of the joint and contracture of traumatised intra-articular tissues.

Analgesia may be necessary until the pain in the joint subsides following the intravenous infusion of the plasma product. Analgesia must never be given as an alternative to plasma therapy. Aspirin should be avoided because of the inhibition of platelet function by acetylicylic acid. Paracetamol, dihydrocodeine, pethidine or morphia may be required.

The aim of physiotherapy during the acute phase following the haemorrhage into the joint are, firstly, to prevent muscular atrophy. If the muscles supporting the joint are allowed to weaken by disuse, the joint will remain supported by ligaments only, and will be susceptible to further trauma and haemorrhage. Secondly, contractures of intra-articular tissues must be prevented. If an injured joint is left immobile for some time, the capsule and ligaments of the joint may contract into the position of immobilisation. The joint should therefore be moved through as full a range as possible as soon as it is painfree. Muscular spasm must be reduced. Spasm of the flexor muscle of a joint occurs commonly after injury to the joint, and may be a further cause of contractures.

Intracerebral Arteriovenous Malformation

MILES, B. M. and MAY, H. I. (*J. Louisiana State Med. Soc.*, **124**: 327, 1972) from the Department of Radiology and the Department of Surgery, Confederate Memorial Medical Centre, Shreveport, Louisiana, write:

This article attempts to show the importance of adequate radiographic localisation techniques to determine operability of an A. V. malformation. Initial carotid arteriogram demonstrated the A. V. malformation; however, a repeat study combined with a pneumoencephalogram, helped in precisely localising the lesion. The most important aspect of the repeat cerebral angiograms was inclusion of the vertebral injection along with the carotid injection to demonstrate one of the principal arterial feeders from the posterior choroidal vessel on the left.

Although many people might feel that a lesion situated as such, deep in the left cerebral hemisphere, would not be a good surgical risk, the operating team left that the patient could benefit from surgery, particularly in view of her age, accessibility of the lesion, and high morbidity and mortality rate generally seen with succeeding bleedings from A. V. malformations. The patient did well postoperatively and three months postoperatively, the only residual was minimal decrease in co-ordination of the right hand.

Medical Students and Psychiatry Courses

WAKEFIELD, H., LANDAU, S. and WERKMAN, S. L. (*Rocky Mountain Med. J.*, **69**: 48, 1972) from Denver, Colorado, comment:

Responses from students indicate that they believe direct patient involvement and "medical model" responsibilities will have the greatest usefulness for the later practice of medicine. In a program organised around the concept of "experiential teaching", students showed significant increases of empathy and interest in psychiatry and psychiatric patients, and significant decreases in anxiety by the end of their clerkship.

An attempt is being made to tailor the course in clinical psychiatry to the needs of today's physician, and it is felt that the consumer himself should have an important voice in planning. Evaluation of the medical students' responses is felt to be a useful means of assessment of the teaching program; the students' view of their experience, in terms of its usefulness for the practice of medicine, can be used to structure teaching more effectively. Another consumer resource, untapped as yet, is the practicing physician. Viewing the medical school course in psychiatry from the vantage point of clinical experience, he could offer perhaps the most useful comment as to the relevance of the current psychiatric course to clinical medical practice. It is hoped that a productive dialogue might be initiated with physicians in the Rocky Mountain area and that the experience of the practicing clinician might be utilised in the ongoing evaluation of the psychiatric teaching program.

CURRENT TOPIC

Women in Sports†

N. N. ROY CHOWDHURY*

Almost no one would deny that women have just as much right and need to practise sports as men, yet as recently as 1952 almost half of the countries represented at the Helsinki Olympic games sent no women competitors at all. Women first competed in the modern series of Olympic games in 1900 in golf and tennis. They had never been allowed to participate as contestants in the ancient series, and for many centuries were barred even as spectators. Subsequently, they participated in figure skating, swimming, gymnastics, track and field, skiing, fencing, volley-ball and other sports. They appear now to have overcome those objections formerly made on the basis of aesthetics and supposed physiological limitations.

The days have changed so much and so fast that there are very few countries now not sending women competitors to the Olympic games. Their performances today are considered to be an integral part of the games, and they certainly add to their attractiveness.

The change has gone so far that nowadays the differences that exist between men and women when it comes to sports are not always acknowledged. Women are, by and large, smaller and lighter with less muscle to total body weight, a faster heart beat for the same amount of oxygen carried through the body and, of course, anatomical differences. These include a generally longer trunk in relation to the legs and a lower centre of gravity. Differences between boys and girls show up very early and can be seen in athletic performances by the age of nine or ten. In exercises, such as, the long jump, by the age of eleven the average boy will cover a distance half as much again as the average girl.

TRAINING:

In many societies, girls are educated in exactly the same way as boys and they are often tempted to rival the boy's athletic exploits. Indeed, women's records in competitive sports are now almost all equal to those set by men at the beginning of the century. The training of women gives results as good as those with men. Their performances begin at a lower level and reach a maximum below that of men, but the range is the same. In comparing performances, however, a trained woman athlete can usually throw or jump further and run faster than an untrained man of comparable age.

In speaking of training for women, one sports medicine specialist has explained why many sports women in competition not only equal, but often surpass their previous performance after the birth of their first child. In his opinion, the strain on the organism produced by pregnancy, a steadily graded effort over a period of nine months, is the equivalent of a long period of permanent and natural training with durable effects.

PREGANANCY AND SPORTS:

For a number of experts, pregnancy should not be a reason to stop all sports. On the contrary, as long as a woman has her doctor's permission, regular exercise is a necessity for women who are accustomed to it as well as for others. Walking and gymnastics are almost universally recommended throughout pregnancy. Of course, all the specialists are unanimous that women should not engage in any competitive sports or even in strenuous training for competition during pregnancy. The body has enough tasks to perform without any added burdens.

There is a persistent tradition that active sportswomen are likely, by virtue of being "muscle bound", to have protracted and difficult labour and childbirth, but detailed observations disprove this old wives' tale. Women, active in sports, have on the contrary shorter labour than the average and childbirth is no more difficult than for their sedentary counterparts.

MENSTRUATION AND SPORTS:

From the age of puberty onwards the question of

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†Presented in the Seminar on Sports Medicine in Calcutta on 23.11.72 organised by Indian Association of Sports Medicine (West Bengal)

R. G. Kar Medical College, Calcutta

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menstruation invariably arises in connection with the practice of sports. In classical manual on physical education for girls, published 50 years ago, girls were forbidden to undertake any form of physical exercise during menstruation. Today, the answer is very different. Most experts hold that the practice of systematically excusing teen-age girls from school gymnastics during their period has the effect of implanting the idea that they are "ill" or disabled on those days. That may ultimately bring a lot of psychologically induced menstrual difficulties.

Most gynaecologists warn against any sort of overexertion during menstruation and particularly advise against swimming, because there would seem to be some increased possibility of infection during menstruation. On the other hand, specialists in sports medicine say that there are no real medical reasons not to swim during menstruation.

Increasing participation of women in competitive sports has raised the question—what influence does the menstrual cycle have on athletic performance in the female? Another question which might be considered is—what effect does vigorous training routines and intense competition have on the menstural period? Doring (1963) assessed the muscle power co-ordination quotient of athletic efforts in different phases of the menstrual cycle. He also investigated the relevant psychological factors associated with menstruation. The result of his study showed a reduction in athletic performance during the menstrual phase. According to him, the best time of cycle for athletic performance is the immediate post-menstrual phase. When menstruation coincides with an athletic event, Doring (*loc. cit.*) recommended postponing the period with norethisterone. Pierson and Lockhurt (1963) found no significant changes in reaction and movement time during the menstrual cycle. They have suggested that the lessened efficiency observed by others during the premenstrual and menstrual phase may be due to lack of concentration because of discomfort.

Zaharieva (1965) surveyed the women competitors who took part at the Tokyo Olympics in 1964. He found that when competing during a menstrual period, sportswomen showed no difference in performance in 36.9 per cent, a variation in performance in 27.7 per cent and a poorer performance in 17 per cent. The effect on performance was most marked in swimmers Greenhill (1968) commented that performance in sports falls off in the premenstrual period whereas during the menstrual period there is a tendency to return to scores recorded under normal conditions. Wearing *et al*. (1972) investigated a large number of women athlets at the University of Western Ontario. Their study indicates that the female athlete could expect her poorest performance during the menstural period and her best performance during the intermenstrual phase. This, of course, raises the question of artificially altering the menstrual cycle with oestrogen—progesterone combination of drugs so that the athlete would always be performing in the intermenstrual phase. In that case the toxic effects of the drug on the women competitors, especially with short term use would have as deleterious effect on performance as the menstrual cycle itself. The toxic effects are mostly due to the oestrogen component. Recently, newer and more potent progestational agents have become available. With these agents, it might be possible to manipulate the menstrual cycle without toxic effects.

SEX AND VARIANTS:

Most young ladies, we are pleased to observe, are readily identifiable as ladies. Of course, every physician knows that the visible appearances of feminity are less obvious in some women, who are nonetheless completely feminine. It is also true that some young men, particularly when they wear women's clothing, are extremely difficult to distinguish from the ladies without a physical examination. There has been concern for a number of years that among the more successful female competitors many would be found who exhibited male characteristics, and who might be pseudohermaphrodites. This suspicion was given substance by the case of a Polish women who set a world record in 1934 and two women medal winners for France at the European tract and field championships in Oslo in 1946, all of whom subsequently declared themselves as men (Royan, 1968). One of the French athletes joined the airforce and the other, after some plastic surgery, married and had children.

Examinations of the external genitalis were subsequently required of women competitors at the Olympic games, although the regulation was more honoured in the breach than in the observance in recent years. At a recent sports meet under the International Amateur Athletic Federation a striking coincidence occurred at the time of physical verification of the sportswomen. Suddenly there was an unfortunate epidemic of some unidentified illness or injury which prevented several members of the U.S.S.R. team from attending the meet (Editorial, 1966). Not surprisingly, other athletes objected to parading in a state of undress before a panel of gynaecologists even though the latter were apparently women.

In the medical history of Olympic games there are many other problems of sex determination among the women competitors. In 1955, it was revealed that Dora Ratjen, who had won the olympic high jump for Germany in 1936, was living in Hamburg, West Germany, under the name of Hermann. He was apparently participating in the games as a transvestite, whether forced to do so (as he claimed) or otherwise. The North Korean holder of women's records in the 400 and 800 metre runs was subsequently revealed to be a man.

Questions were raised regarding Iolanda Balas, Romanian high jump winner in the Olympic of 1960 and 1964 and holder of the world record for women, although she is supposed to be married and said to have a child of her own.

Now, in addition to the general physical examination it is expected that all contestants will have before coming to the games and all women entrants will have a buccal smear made for a test of their sex genotypes. If any question is raised by this screening procedure as to the sex of an athlete, a special physical examination will then be performed by a team of gynaecologists to determine the phenotype and gonadal sex. This determination of sex in some cases may be extremely complicated and unreasonable dependence on buccal smears for determining the sexual identity of athletes can lead to unjustified declarations of ineligibility for sex reasons. In most individuals, the nine components of sexual phenotype (external genital appearance, internal reproductive organs, gonadal sex, endocrinologic sex, genetic sex, nuclear sex, chromosomal sex, physiological sex, social sex) conform with one another, whereas in persons with sexual abnormalities there may be considerable disagreement of these aspects of sexual identity. For this reason buccal smears, reflecting chromatin or nuclear sex, or chromosomal analyses, indicating chromosomal sex can not be used as indicators of 'true sex".

RISKS:

Even in these days of women's liberation movement, sportswomen should not forget that although they do very well in many sports, but when they try to equal or outdo men they run a risk due to their lighter bone and muscle structures. They seem to have muscle strain more frequently, more sprains and strangely enough, many more finger injuries even in relatively innocuous games like volley-ball and basket ball. Some sports may lead to anatomical changes to such an extent that those are not compatible with the traditional ideas of feminine grace and beauty e.g., shot-put and javelin throw. Even swimming, that most graceful of sports, is not unqualifiedly feminine from this point of view. Butterfly and breast stroke in competition doses may lead to highly developed shoulder, back and chest muscles. The most harmonious feminine athletic pursuit is perhaps gymnastics—particularly yogic exercises which keep both body and mind fit and cheerful.

CONCLUSION

In conclusion it may be said that with proper selection of the type of sport events, competition doses and disciplined training programme women not only do well in sports but the latter aim at harmonious development of body and mind.

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NOTES AND NEWS

Cut in Budget on I.C.M.R. Affects Research and Jobs

It is learnt that Indian Council of Medical Research—the primary agency promoting medical research in India—had told researchers throughout the country that it will not finance any new research project this year because of a 50 per cent cut in its budget, reports *P.T.I.*

One immediate effect of the budget cut on I.C.M.R. was the cancellation of some 370 out of about 700 old at well as new research programmes in health and family planning.

I.C.M.R. is believed to have also reduced the number of scientific seminars and the number of its technical reports and other publications.

About 1,000 medical technicians have been rendered jobless in Delhi because of the cancellation of I.C.M.R. projects, it is learnt.

In the All-India Institute of Medical Sciences alone some 700 research assistants and I.C.M.R. fellows with M.Sc. degree would have to look for some other jobs before September, a professor of the Institute said. The grants for 270 fellows have already been terminated.

I.C.M.R., it is believed, has also cancelled the plans for starting clinical trials of a new male contraceptive pill developed by Prof. M. R. N. Prasad of the Delhi University because of lack of funds.

Xanthotoxin Can be Made in India

Xanthotoxin, a remedy for leucoderma, which is now imported can now be produced in India, according to a press release from the Council of Scientific and Industrial Research (CSIR).

The process for obtaining this drug from the seeds of the plant "*ammi majus*" has been developed by the Regional Research Laboratory in Jammu.

D. T. M. & H. and L. T. M. & H. Courses, 1973-74

The nine months' course of instruction for the

(1) D.T.M. & H. (Diploma in Tropical Medicine and Hygiene) under the Calcutta University and (2) L.T.M. & H. (Licence in Tropical Medicine and Hygiene) under the Faculty of Tropical Medicine and Hygiene, West Bengal, will begin from *October 15, 1973*. The D.T.M. & H. course is open to medical graduates of Indian universities or candidates possessing equivalent qualifications recognised by the Calcutta University for this purpose, who have been engaged in medical practice for a continuous period of at least 15 months or held residential appointment in a teaching hospital for at least one year. The L.T.M. & H. course is open to medical licentiates registered with any State Medical Council of India, Medical graduates may also be admitted to this course if they desire. Application for admission in the prescribed form (obtainable from the School Office) should reach the Director, School of Tropical Medicine, Calcutta-12 by *August 31, 1973*.

I.D.P.L.'s Expansion Programme

The state-owned Indian Drugs and Pharmaceuticals has adopted an expansion programme. Estimated to cost Rs. 65 crores during the Fifth Plan period, the programme envisages the setting up of one or two more drug units in the country for the production of 15 new synthetic drugs and eight new antibiotics. The production capacities for two antibiotics and 15 synthetic drugs already being produced at Rishikesh and Hyderabad Plants will also be increased during the Plan period to meet the growing demand in the country.

The sale of Rs. 28 crores by I.D.P.L. during this year, the last year of the Fourth Plan, is expected to touch Rs. 123 crores a year by the end of the Fifth Plan.

The expansion programme is also expected to effect an annual saving of Rs. 26 crores in foreign exchange and save the country from continued dependence on imports of life-saving and essential medicines.

A five member delegation led by Dr. Jagjit Singh, Chairman of the I.D.P.L., recently visited Moscow to explore the possibilities of Soviet collaboration for expansion in the production of antibiotics and synthetic drugs in India during the Fifth Five-Year Plan.

Doctors in the News

The Union Government has appointed Lt-General Inder Singh as Scientist Emeritus in Medicine for Armed Forces. Known for original contributions to the international medical literature on diabetes, ischaemic heart disease, hypertension, asthma and migraine, Lt-General Inder Singh was until recently Chief Consultant in Medicine to the Armed Forces.

The international awards comprising fellowships, scholarships and other grants given annually by the Lady Tata Memorial Trust for study and research in the disease of the blood with special reference to leukaemias have gone for the year 1973-74 to Dr. J. S. Nadkarni of India, Dr. M. A. S. Moore of Great Britain and Dr. L. E. Mobraaten and Dr. P. D. Gorbach of U.S.A. Dr. (Miss) P. Sethi of New Delhi is one of the 3 recipients of senior scholarship of Rs. 500 per month and Dr. A. M. Rao of Bombay, is among the 7 recipients of junior scholarship of Rs. 300 per month for scientific investigations having a bearing on the alleviation of human suffering resulting from disease.

Dr. N. N. Roy Chowdhury, Reader in Obstetrics and Gynaecology, Calcutta Medical College and Hospitals, and an Hony. Associate Editor of the Journal of I. M. A., has been invited to present two scientific papers and display films on 'Mitra Operation' for Cancer of the Cervix at the 7th World Congress of Obstetrics and Gynaecology to be held in Moscow on August 12-16, 1973.

CORRESPONDENCE

The Editor is not responsible for the views expressed by correspondents

Treatment of Malabsorption Syndrome

SIR,—I read with interest the paper entitled "Malabsorption Syndrome" by Chakraborty *et al.* (*J. Indian M. A.*, **60**. 375, 1973). May I invite your attention to certain views expressed in its management part.

Firstly, the authors said: "In Crohn's disease, the poorly absorbed sulphonamides (sulfadiazine, sulfisoxasole) is helpful". This statement does not appear to be correct. Sulphadiazine and sulfisoxazole belong to the group of sulphonamides which are absorbed rapidly and excreted rapidly (Goodman and Gilman, 1970).

Secondly, the authors further stated, "Penicillin and tetracyclines are to be best avoided because of their tendency to produce candidal or enterococcic diarrhoea". It is not entirely correct to implicate penicillin in the causation of superinfection (candidal or staphylococcal) to the same extent as tetracyclines. In this regard, I am inclined to quote from certain authentic texts:

1. "Although this occurs in practically all individuals, it is usually of no clinical significance and the normal microflora is re-established shortly after therapy is stopped. In some persons, however, superinfection results from the changes in flora. The incidence of superinfection with penicillin therapy is about 1 per cent" (Goodman and Gilman, *loc. cit.*).
2. "Mild diarrhoea may occur with oral penicillin, due to interference with the normal intestinal flora. Super infection in the bowel is uncommon" (Laurence, 1966).

Penicillin is the queen of antibiotics; it is bactericidal and broad-spectrum also (ampicillin, hetacillin, carbenicillin, etc.); apart from hypersensitivity in genetically predisposed sensitive individuals, which is very rare, of course, penicillin is the most non-toxic and well-tolerated antibiotic and hence is indispensible in therapeutics. A patient who really needs it for his ailment should not be deprived of this unique antibiotic with matchless efficacy due to incorrect assessment of its side effects.

The aim of this correspondence is to clear any possible confusion which might crop up when one goes through this informative and useful article.

I am, etc.,

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OBITUARIES

Dr B. B. Dutta

Born in 1900 Dr. Binode Behari Dutta took his matriculation and I.Sc. examinations from Khagoul E. Rly. High School, T. N. J. College, Bhagalpur. He passed the B.Sc. examination from City College with distinction in 1921 and qualified for M.B. degree from Calcutta Medical College in 1927 with gold medal in jurisprudence. He started private practice at Jamalpur and shortly established himself as a successful practitioner.

Dr. Dutta was a founder-member of the Jamalpur and Monghyr Branch of I.M.A. and was closely associated with the Jamalpur Branch till his last days.

He leaves behind four sons and two daughters.

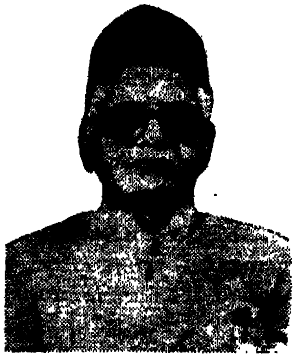
Dr. P. N. Malhotra

Dr. P. N. Malhotra, passed away on 22-4-73 following renal failure. Born in 1919 at Ambala Cantt. Dr. Malhotra qualified as an L.C.P.S. from Bombay in 1943 and started private practice at his home town.

Shortly he joined the I.M.A. Ambala Cantt. Branch and was an active and enthusiastic member of the branch till the closing years of his life. He was also associated with a number of educational institutions run by the Arya Samaj.

Dr. Malhotra is survived by his aged mother, wife, a son and three daughters.

DR. P. N. MALHOTRA



DR. S. N. MAHAJAN

Dr. S. N. Mahajan

Dr. S. N. Mahajan, a former President of I.M.A. Anjangaon Branch in Maharashtra, died of heart-failure on 30-12-71. Hailing from a poor family Dr. Mahajan struggled his way to success in his professional life. He endeared himself to all by his friendly manners, sense of humour and sincere service to the ailing. During his long association with Anjangaon Branch, he immensely contributed to its progress. His profound expreience and deep studies were a great help to the members of the branch in their need.

Dr. Mohit Kumar Sanyal

An old member of I.M.A. Jalpaiguri Branch Dr. Mohit Kumar Sanyal breathed his last on 12-5-73 following a heart attack. He was 53.

DR. MOHIT SANYAL

Dr. Sanyal qualified as an L.M.F. in 1946 and started private practice in Jalpaiguri town. He took keen interest in the development of the I.M.A. Jalpaiguri Branch and was Joint Secretary of the organising committee, when the branch hosted Jalpaiguri session of the Bengal State Medical Conference. He was also Joint Editor of the Souvenir published on that occasion.

A reputed social worker, Dr. Sanyal was also elected a commissioner of the Jalpaiguri municipality. He is survived by his old mother, wife, a daughter and a son.

SUPPLEMENT

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

Vol. 61, No. 3 CALCUTTA AUGUST 1, 1973

Association Notes

XLIX All India Medical Conference To Be Held at Hubli (Mysore) on December 28-30, 1973

In course of a circular issued from the I.M.A. Headquarters, New Delhi, Dr. P. C. Bhatla, Hony. General Secretary, I.M.A. announces :

At the invitation of the Hubli Branch of the Indian Medical Association (Mysore State), the Central Council of I.M A. at its annual meeting held at Ahmedabad on December 27-28, 1972 has decided to hold the 49th session of the All India Medical Conference at Hubli. The Conference will be on December 28, 29 and 30, 1973

The Hubli Branch has elected Dr. M S Anantharaju, Associate Professor of Surgery, Karnatak Medical College, Hubli, as the Organising Secretary of the Conference The Branches are requested to give the Conference a wide publicity.

The Indian Medical Association (Headquarters) has made an application to the Government of India in the Ministry of Railways (Railway Board) for usual rail concession for travel to and from the Conference A further communication will follow as soon as the concession is granted.

The schedule of meetings of various I M A bodies which will be held at Hubli immediately before or during the Conference, will issue later.

Chairman, Reception Committee, Appeals to I.M.A. Members

Dr. G. V Joshi, a past President of I M A and Chairman of the Reception Committee, 49th All India Medical Conference, Hubli, has issued the following appeal to all members of I M.A .

The members of the Hubli branch of the Indian Medical Association feel very much honoured for having been given an opportunity to hold the 49th All India Medical Conference at Hubli A reception committee has been formed under my chairmanship with Dr M S. Anantharaju as Organising Secretary and Dr K Subramanian as Treasurer More than 1,200 delegates and visitors are expected to attend the conference and the Organising Committee is making allout efforts to make the conference a grand success. We look forward to your participation and a hearty welcome awaits you and your family

Hubli and Dharwar are the twin cities of Hubli-Dharwar Corporation, situated midway between Bangalore and Poona on the national highway—connected by rail, road and also by air *via* Belgaum air-strip, which is hardly 60 miles. Hubli is the second biggest city in Mysore State and an educational, business and industrial centre. The place of the conference will be at the Karnatak Medical College which is one of the premier institutions of the State, imparting both undergraduate and postgraduate medical education and has a superb campus. Accommodation for delegates and visitors will be arranged in the various hostels in the campus and the hotels in the city at moderate charges on prior intimation and on priority basis.

Dharwar is an important centre for learning. She can boast of the famous Karnatak University with its beautiful garden, outlay and pleasant surroundings. Not far away from Hubli there is a number of places of historical, architectural religious and scenic interests, some of which are the famous Jog Falls, Golgumaj Bijapur, Vijaya Nagar Hampi, Tungabhadra Project, Badami, Aihole, Karwar beach, Goa, etc In fact the State of Mysore itself is a tourists' paradise, to mention a few Halebid, Belur, Shravanbelgol, city of Mysore and Bandipur.

Weather in Hubli will be cool and refreshing indeed in the month of December and delegates and visitors are advised to bring along light woollen clothings.

The success of this conference will be entirely due to your participation and co-operation.

Papers for the Scientific Session to be Sent Before September 30, '73

Dr M S Anantharaju, Organising Secretary, 49th All-India Medical Conference, Hubli (Mysore), states :

The 49th All India Medical Conference will be held in the last week of December, 1973, at Karnatak Medical College, Hubli Mysore

Members of the I M A , who want to present papers at the Scientific Sessions, are requested to send in the same type written in triplicate to the Chairman, Scientific Committee, 49th All India Medical Conference, Karnatak Medical College, Hubli 580022, Mysore, on or before *September 30, 1973*

I.M.A. Kerala State Branch Observes 'Protest Day' All Over the State against Kerala Medical Practitioners' Bill, 1972

On 24th of June the streets of many small and big towns in Kerala State resounded with slogans like 'Down with K M P Bill, 1972', 'No need of Tahsildar certified Doctors', 'Don't legalise quackery in medical practice', 'Accept I M A 's demands and safeguard peoples' health'. It was the All-Kerala Protest Day observed by the branches of I M A. in the State against the objectionable provisions of the Kerala Medical Practitioners' Bill, 1972

It may be recalled that the State Working Committee of the I.M.A. Kerala State Branch had unanimously decided in its meeting at Quilon on May 27, 1973 to intensify its campaign against what it considered as an attempt of the State Government to 'legalise quackery'. It demanded drastic modification of the Kerala Medical Practitioners' Bill which had been referred to a select committee of the State legislature and it called upon the members of the profession all over Kerala to voice their resentment at the deleterious provisions of the K.M.P. Bill like registration of unqualified persons by a Tahsildar in the name of extending medical aid to the rural people and to areas lacking such facilities.

Not only the practitioners of modern scientific medicine whom the I.M.A. represents, but also large sections of the people whom the K.M.P. Bill is supposed to benefit joined the protest meetings. Participation of hundreds of medical students from different medical colleges of Kerala in the protest marches was a conspicuous feature of the Protest Day. Almost all local language dailies and periodicals and leading English dailies circulating in the State such as The Hindu covered the observance of the Protest Day.

The following reports of observance of the Protest Day by some of the branches (*reports from other branches are awaited*) have been received by the I.M.A. Headquarters from Dr. A. Thyagarajan, Hony. Secretary, Kerala State Branch, Calicut :

CALICUT

The State Branch headquarters of I.M.A. at Calicut observed Protest Day in the city with great enthusiasm. Dr. N. S. Satyanarayana, Senior Vice-President, I.M.A. (Centre) come down from Bangalore to Calicut to supervise the observance of the Day. There was a press conference in the morning at Hotel Alakapuri where Dr. Satyanarayana explained the I.M.A.'s stand with regard to the K.M.P. Bill. Later in the evening a public meeting was held at Sree Narayana Centenary Hall which was addressed by Sri Arangil Sreedharan, ex-M.L.A., Sri P. P. Ummerkoya, ex-Education Minister of the State and Editor, 'Viplavam', Sri Ratna Singh and Sri P. M. Mohamad Ali, Advocates, besides Dr. Satyanarayana and other office-bearers of the State Branch. The Students' Wing of the I.M.A., Calicut Medical College, took keen interest in implementing the day's programme. All participants also wore black badges.

TRIVANDRUM

A silent procession of more than 200 members of the medical profession including teachers of Trivandrum Medical College and students started from the I.M.A. Hall in the afternoon and proceeding along the M. G. Road reached the University Students' Building. The procession was led by two senior members, Dr. K. P. R. Warrier and Dr. R. Ananthanarayanan. All members wore black badges and many carried placards and banners inscribed with slogans in both Malayalam and English like 'Don't legalise quarkery in medical practice', 'Accept I.M.A.'s Demands on K.M.P. Bill '72', "We need no Tahsildar-certified doctors', 'Down with K.M.P. Bill, '72', etc. About 1,000 copies of a leaflet printed in Malayalam stating I.M.A.'s demands were distributed to the public during the silent march. The demonstration over, a public meeting was held at the University Students' Centre building. At the meeting Drs. K. P. R. Warrier, P. Krishnamurthy, R. Ananthanarayanan and M. P. Manomohan explained the reasons for I.M.A.'s objection to the Bill. Dr. G. B. Vaman Rao presided over the assembly and Dr. S. Hariharan, Hony. Secretary, Trivandrum Branch, thanked all participants.

TRICHUR

A protest meeting was held at the I.M.A. House in the evening which was addressed by the President of the branch Dr. Vincent D. Bayilis, Vice-President Dr. K. K. Rahulan and a retired Civil Surgeon Dr. V. K. Narayana Menon. Resolutions were passed recording the profession's resentment at the provisions in the Bill like maintenance of the register of modern medicine in parts A, A.1, and B.

COCHIN

A procession of about 200 doctors including women wearing black badges marched through the main streets of Ernakulam town. Placards bearing slogans like 'Down with K.M.P. Bill', 'Don't mix medicine with politics', 'No need for Family Planning when you rely on Tahsildar certified quacks to help control population explosion', etc. A meeting was held at the I.M.A. House in the evening when the President of the branch Dr. Urumese, Hony. Secretary Dr. Thomas, and Advocate Sri S. Eswara Iyer explained in detail the implications of the Bill so far as the interests of practitioners of modern medicine were concerned.

KOTTAYAM

A press conference was convened on the eve of the protest day where Dr. Samuel Krishnamoorthy of Grace Hospital, Changannacherry and an active member of the State Action Committee, explained in unmistakable terms the I.M.A.'s stand on the objectionable provisions in the Bill. Malayala Manorama, one of the leading language dailies in the State, had given full coverage to this press meet. On the Protest Day a public meeting was held which was addressed among others by Dr. S. Krishnamoorthy and Sri N. Vijayakumar, Convener, Reorganisation Committee on Medical Education.

PALGHAT

A protest day was observed under the presidentship of Dr. K. P. Achutha Menon. Dr. K. J. Mathai of the District Hospital, Palghat, Mr. C. R. Nair, President of the Lions Club and Sri O. Rajagopalan, State Secretary, Jansangh, spoke on the objectionable features of the Bill.

CANNANORE

A protest meeting was held under the auspices of the local branch under the chairmanship of Dr. K. E. Gopalakrishnan, where the I.M.A.'s stand on the Bill was explained by different speakers. Pamphlets explaining the views of I.M.A. on the Bill were distributed to the public.

TELLICHERRY (NORTH MALABAR)

In observance of the Protest Day the branch organised a procession in which both governments doctors, and private practitioners joined. With black badges on they assembled at noon in front of the Tellicherry Fort in their cars and formed into a motorcade, which passed through the main streets of the town. Dr. A V. Subramaniam, Hony. Secretary of the local branch, headed the procession. The cars carrying banners bearing slogans in protest of the Bill drew large crowds on both sides of the streets.

MALAPPURAM

Members of the branch assembled at a meeting in the evening at Tirur and adopted a resolution recording their strong resentment over the undesirable provisions in the Bill.

XV I.M.A. Study Tour to U.S.A. and Canada— October 9-23, 1973

The Indian Medical Association announces the XV I.M.A. Study Tour to U.S.A. and Canada.

ELIGIBILITY :

Participation in the tour is open only to members of the I.M.A. College of General Practitioners of at least six months standing. Their families may accompany them. Preference will be given to Fellows and Life Members of the College.

REGISTRATION :

The registration will be on "first come first served" basis on receipt of application in prescribed form and a *Bank Draft* of a deposit of Rs. 200/- per person (Rs. 400/- in the case of a couple) in the name of "Indian Medical Association".

COST OF TOUR :

For those who travel under Foreign Travel Scheme the cost of the tour is Rs. 7,000/- per person payable as follows : Rs. 200/- per person with the application for registration and the balance of Rs. 6,800/- per person by *August 31, 1973.*

For those who travel on Foreign Exchange Permit the cost of the tour is Rs. 4,750/- plus US $ 300 per person payable as follows :

a) Rs. 200/- per person with the application for registration and the balance of Rs. 4,550/- per person by *August 31, 1973.* (All payments by *Bank Drafts* in the name of "Indian Medical Association or in *Cash*. No cheques will be accepted).

b) US $ 300 (in foreign currency) on the start of the tour.

This cost includes—

a) Air fare-Delhi (Bombay)/New York/Delhi (Bombay);

b) Government of India Foreign Travel Tax ;

c) Airport and local taxes ; Delhi/Bombay/New York ;

d) Visa charges (Visa forms will be sent to the participants after their registration) ;

e) I.M.A. Headquarters administrative expenses ;

f) Hotel accommodation in double rooms (*without meals*) and sight-seeing as per itinerary in New York, Philadelphia, Washington, Buffalo, Niagra Falls, Montreal, Quebec and Boston and transfer on arrival at New York.

For particulars please write to : Hony. General Secretary, Indian Medical Association, I.M.A. House, Indraprastha Marg, New Delhi 1.

XVI I.M.A. Study Tour to Europe and the U.K.— October 12-28, 1973

The Indian Medical Association announces the XVI—I.M.A. Study Tour to Europe and the U.K. This tour gives the participants opportunity to visit medical institutions/hospital, meet colleagues in different countries to share and exchange views on current medical topics, as well as attend General Assembly of the World Medical Association at Munich, Germany (October 14-20, 1973).

The rules for eligibility and registration of participants are the same as for the XV Study Tour.

COST OF TOUR :

For those who travel under Foreign Travel Scheme the cost of the tour is Rs. 6,550/- per person for the tour of Europe and the U.K., payable by bank drafts or in cash (not by cheques) as follows : Rs. 200/- per person with the application for registration and the balance of Rs. 6,350/- per person by *August 31, 1973.*

For those who travel on Foreign Exchange Permit for Munich and London the cost of the tour is Rs. 4,950/- plus US $ 214 per person for the tour of Europe and the U.K., payable by bank drafts or in cash (not by cheques) as follows :

a) Rs. 2//- per person with the application for registration and balance of Rs. 4,750/- per person by *August 31, 1973.*

b) US $ 214 (in foreign currency) on the start of the tour.

This cost includes—

a) Air fare from India and back ;

b) Government of India Foreign Travel Tax ;

c) Airport and local taxes ;

d) Visa charges (Visa forms will be sent to the participants after their registration) ;

e) I.M.A. Headquarters administrative expenses ;

f) Hotel accommodation in double rooms (without meals but with continental breakfast at Amsterdam, Zurich, Rome, Paris and Munich). Accommodation in London is not included in the cost and participants of the tour will have to make their own arrangements there.

g) Sight-seeing with English-speaking guide at Amsterdam, Paris, Munich, Zurich, Rome and full day excursion to Inns Bruck (Austria) ;

h) Transfers on arrival and departure from airport to hotel and *vice-versa* in Amsterdam, Paris, Munich, Zurich and Rome. In London transfer will be provided from Airport to Victoria Terminal at the time of arrival there. Arrangements for further transport and for boarding, lodging, etc., for the period of stay in London will have to be made by participants themselves at their cost.

Other particulars may be had of the Hony. General Secretary, Indian Medical Association, I.M.A. House, Indraprastha Marg, New Delhi 1.

Amendments to Memorandum, Rules & Bye-laws of the I.M.A.

Certain important amendments to Rules and Bye-laws of the Indian Medical Association were passed by the Central Council at its 32nd annual meeting held at Ahmedabad on December 27 and 28, 1972. *It was decided by the Central Council that these amendments should come into force with immediate effect, except those relating to increase of H.F.C. and subscription which were to come into force with effect from 1st October, 1973.* Attention of the Hony. Secretaries of all State/Territorial and Local Branches of I.M.A. was drawn to these amendments by Dr. P. C. Bhatla, Hony. General Secretary in course of a circular (No. F. 1(11)/37/72-73) dated 21-4-73 issued from the I.M.A. Headquarters, New Delhi.

To enable the branches to act according to the rules and bye-laws of the Association as amended in the 32nd annual meeting of the Central Council at Ahmedabad, the amendments are reproduced below :

OLD RULES

Rule—3

Register of Members :

3. There shall be a Register in which the names of all the Members of the Association shall be entered with their qualifications and addresses.

Rule—6

State/Territorial Branches :

6. All local branches within a State of India or a Union Territory shall form a group to constitute a State or a Territorial Branch respectively.

Rule—7

Direct Local Branch :

7. If there is no State or Territorial Branch in a State, the Local Branches in that State may, at their discretion, be attached to the Headquarters as Direct Local Branches or to any of the neighbouring State or Territorial Branches.

Rule—10

10. Local Branches within the jurisdiction of a State or Territorial Branch shall refer all matters concerning the State and Central Governments to the State or Territorial Branches for final decision in such matters ; State or Territorial Branches shall likewise refer all matters concerning the Government of India or India as a whole to the Headquarters for necessary action.

Rule—39

Arbitration :

39. All disputes and differences not otherwise provided between a member of the IMA/State Branch/Territorial Branch/Local Branch and the Indian Medical Association, shall be referred to arbitration as per Bye-laws. All arbitration proceedings shall ordinarily be held at Delhi unless the arbitrator with the consent of the parties decides otherwise.

NEW RULES AS PASSED

Rule—3

Register of Members :

3. There shall be a register of members of the Association which shall be maintained at the Headquarters Office in such manner and showing such particulars as may be prescribed by the Working Committee from time to time.

New Rules As Passed—*Contd.*

Rule—6

State/Territorial Branches :

6. There shall be a State/Territorial Branch of the Association for each State/Union Territory in India which shall have jurisdiction over all local branches of the Association within its area.

Provided, however, where in a State/Union Territory there is only one Local Branch and its membership strength exceeds 100, the same shall also be treated as State/Territorial Branch and shall perform the functions of a State/Territorial Branch accordingly.

Provided further that all the existing State/Territorial Branches shall have jurisdiction over the Local Branches of the Association within its State/Union Territory for the time being.

Explanation :

For the exercise of jurisdiction over the respective area of State/Territorial Branch, it shall not be necessary that any particular Local/Direct Branch was or was not in existence or whether the said Local or State/Territorial Branch did or did not take part in the formation of the State/Territorial Branch within whose area the said Local/Direct Branch exists.

Rule—7

Direct Local Branch :

7. Notwithstanding anything contained in these Rules, the Central Council shall have the power to reorganise, abolish and amalgamate any Local/Direct/State/Territorial Branch or Branches.

The Working Committee shall, however, have power to bring a Local/Direct Branch in any State/Union Territory under the jurisdiction of any other State/Territorial Branch as it may specify in this regard.

Provided that the local branches in area of Greater Bombay, except those that have already joined the Maharashtra State Branch, will be direct Branches of the Indian Medical Association till they decide to join the Maharashtra State Branch.

Rule—10

10. Local Branches within the jurisdiction of a State or Territorial Branch shall refer all matters concerning the State and Central Governments to the State or Territorial Branches for final decision in such matters ; State or Territorial Branches shall likewise refer all matters concerning the Government of India or India as a whole *or outside India* to the Headquarters for necessary action.

Rule—39

Arbitration :

39. Any disputes or differences solution for which not otherwise provided between (a) a member of IMA/State/Territorial/Local Branch and (b) the Indian Medical Association, shall be decided by the Working Committee of the Indian Medical Association. Any party raising such disputes shall give at least six weeks' notice of the same to the Headquarters of I.M.A. and the same shall be placed on the agenda of the following meeting of the Working Committee. The Working Committee may regulate its own procedure for the purpose.

OLD BYE-LAWS

SUBSCRIPTION

Bye-law—7

Branch Members :

7. Branch members shall pay their subscription to the Local Branch according to the scale and instalments fixed by the Local Branch—monthly, quarterly, half yearly or yearly, as the case may be. The Local Branch, however shall pay a Headquarters Fund Contribution (H.F.C.) through the respective State or Territorial Branch, if it exists, at the rate of Rs. 13/- per head per year for all the Members on its roll (as per Membership Register maintained at the Headquarters).

Such contributions shall become due on the 1st October but may be paid, in case of existing Members in two equal instalments, not later than the following 31st October and 30th April. Branch or Branches who do not pay their H.F.C. in full on dates mentioned above are liable to be suspended with regard to privileges of membership, on the recommendation of the State/Territorial Branch or the Headquarters in case of Direct Branches. For new Members joining the Association through a Local Branch, the Branch shall pay full year's Headquarters Fund Contribution if the Member joins in the first half of the Association year or half year's Headquarters Fund Contribution (Rs. 6.50) if the Member joins in the second half of the Association year.

Bye-law—9

Direct Members and Attached Members :

9. Direct Members and Attached Members shall pay a subscription of Rs. 16/- per year which shall become due on the 1st October every year. New Direct and Attached Members joining the Association in the second half of the Association year shall pay only Rs. 8/- for that half year.

Bye-law—15

15. In case of husband and wife, both being members of the same Branch, the couple shall pay between them one full subscription and one half subscription for the full Association year; and half of this amount if the couple join in the 2nd half of the Association year; and shall be entitled to one copy of the Journal between them. The Headquarters Fund Contribution for the couple shall be in the same proportion i.e. one and one half.

The amount of H.F.C. (viz. Rs. 13/- + Rs. 6.50 for full year and Rs. 6.50 + Rs. 3.25 for half year) shall be distributed as under :

	Full Year	*Half Year*
Headquarters Share	Rs. 9.50	Rs. 4.75
State/Territorial Branch Share	Rs. 6.00	Rs. 3.00
Journal Quota	Rs. 2.00	Rs. 1.00
IMA Benevolent Fund	Rs. 2.00	Rs. 1.00

Bye-law—17

Collection and Distribution of Subscription :

17. In case of Local Branch Members, out of Rs. 13/- per member paid by the Local Branch as Headquarters Fund Contribution, Rs. 4/- shall be credited to the State or territorial Branch and Rs. 9/- to the Headquarters as Headquarters quota of H.F.C., out of which Rs. 2/- shall be credited to the account of the Journal of the Association and Re. 1/- to I.M.A. Benevolent Fund.

NEW BYE-LAWS AS PASSED

SUBSCRIPTION

Bye-law—7

Branch Members :

7. Branch Members shall pay their subscription to the Local Branch according to the scale and instalments fixed by the Local Branch—monthly, quarterly, half-yearly or yearly, as the case may be. The Local Branch, however, shall pay a Headquarters Fund Contribution (H.F.C.) through the respective State or Territorial Branch; if it exists, at the rate of *Rs. 18/-* per head per year for all the Members on its roll (as per Membership Register maintained at the Headquarters).

Such contributions shall become due on the 1st October but may be paid, in case of existing Members in two equal instalments, not later than the following 31st October and 30th April. Branch or Branches who do not pay their H.F.C. in full on dates mentioned above are liable to be suspended with regard to privileges of membership, on the recommendation of the State/Territorial Branch or the Headquarters in case of Direct Branches. For new Members joining the Association through a Local Branch, the branch shall pay full year's Headquarters Fund Contribution if the Member joins in the first half of the Association year or half year's Headquarters Fund Contribution (*Rs. 9/-*) if the Member joins in the second half of the Association year.

Note : The rate of H.F.C. viz. Rs. 18/- for Branch Member and Rs. 15/- in case of Direct/Attached Members would come into force w.e.f. 1-10-1973.

Bye-law—9

Direct Members and Attached Members :

9. Direct Members and Attached Members shall pay a subscription of *Rs. 25/-* per year which shall become due on the 1st October every year. New Direct and Attached Members joining the Association in the second half of the Association year shall pay only *Rs. 12.50* for that half year.

Bye-law—15

15. In case of husband and wife, both being members of the same Branch, the couple shall pay between them one full subscription and one half subscription for the full Association year; and half of this amount if the couple join in the 2nd half of the Association year; and shall be entitled to one copy of the Journal between them. The Headquarters Fund Contribution for the couple shall be in the same proportion i.e. one and one half.

The amount of H.F.C. (*viz. Rs. 18/- + Rs. 9/-* for full year and *Rs. 9/- + Rs. 4.50* for half year) shall be distributed as under :

	Full Year	*Half Year*
Headquarters Share	Rs. 13.00	Rs. 6.50
State/Territorial Branch Share	Rs. 9.00	Rs. 4.50
Journal Quota	Rs. 3.00	Rs. 1.50
IMA Benevolent Fund	Rs. 2.00	Rs. 1.00

Bye-law—17

Collection and Distribution of Subscription :

17. In case of Local Branch Members, out of *Rs. 18/-* per member paid by the Local Branch as Headquarters Fund Contribution, *Rs. 6/-* shall be credited to the State or Territorial Branch and *Rs. 12/-* to the Headquarters as Headquarters quota of H.F.C., out of which *Rs. 3/-* shall be credited to the account of the Journal of the Association and *Re. 1/-* to I.M.A. Benevolent Fund.

OLD BYE LAWS (*Contd.*)

Bye-law—18

18. In case of a Direct Member attached to the Headquarters, the whole amount of Rs. 16/- shall be credited to the Headquarters out of which Rs. 2/- shall be passed on to the Journal account and Re. 1/- to the I.M.A. Benevolent Fund.

Bye-law—19

19. In case of Direct Members attached to a State or Territorial Branch Rs. 7/- shall be credited to the State or Territorial Branch and Rs.9/- to the Headquarters, out of which Rs. 2/- shall be passed on to the Journal account and Re. 1/- to I.M.A. Benevolent Fund.

Bye-law—43

43. *Election of Office-Bearers*

The President and the Vice-Presidents :

A. *Eligibility*

Such of the members of the Association shall be eligible for contesting to the offices of the President and the three Vice-Presidents who have membership of the Association for a continuous period of at least 10 years.

B. *Electoral Roll—*

All members of the Association who are on the rolls of the members of a local branch or a direct branch and on whose behalf H.F.C. in full for the first half year has been received at the Headquarters office latest by the 15th of May, shall form the Electoral Roll of a local branch subject to the local branch being otherwise valid to take part in the election.

List of valid branches for taking part in election shall be duly published with membership strength on whose behalf H.F.C. for the first half year has been received at the Headquarters office latest by the 15th of May.

C. *Returning Officer—*

The Hony. General Secretary or one of the Hony. Joint Secretaries at the Headquarters of I.M.A. appointed by the President, shall be the Returning Officer.

D. *Nomination—*

The Returning Officer shall on or before the 1st of April each year invite the local branches to nominate one eligible member of the Association for the office of the President and three eligible members of the Association for the offices of the three Vice-Presidents.

The nomination on the prescribed form indicating therein the consent of the nominees must reach the office of the Returning Officer not later than the 20th of May. Nominations received after that date shall not be considered.

E. *Scrutiny and Publication of List of Nominations—*

The nominations received shall be scrutinised at the office of the Returning Officer on the 25th May. The list of valid nominations may ordinarily be published in the Journal of the I.M.A. as well as circulated to the branches for information.

NEW BYE-LAWS AS PASSED (*Contd.*)

Bye-law—18

18. In case of a District Member attached to the Headquarters, the whole amount of *Rs. 15/-* shall be credited to the Headquarters out of which *Rs. 3/-* shall be passed on to the Journal account and Re. 1/- to I.M.A. Benevolent Fund.

Bye-law—19

19. In case of Direct Members attached to a State or Territorial Branch *Rs. 9/-* shall be credited to the State or Territorial Branch and *Rs. 16/-* to the Headquarters out of which *Rs. 3/-* shall be passed on the Journal account and *Re. 1/-* to I.M.A. Benevolent Fund.

Bye-law—43

43. *Election of Office-Bearers*

The President and the Vice-Presidents :

The Honorary General Secretary shall on or before the 15th of April each year invite the Branches to nominate one Member of the Association for the office of the President and three Members of the Association for the Offices of the three Vice-Presidents.

The nomination must reach the office of the Honorary General Secretary not later than the 20th May. Nominations received after that date shall not be considered.

The Honorary General Secretary shall inform, by registered post, before the 5th of June, the Members whose names have been nominated for the offices of the President and the three Vice-Presidents. Any of these Members desiring to withdraw their names must inform the Honorary General Secretary on or before the 25th of June. Non-receipt of any reply in this respect by the 25th of June will be interpreted as consent of the candidates concerned.

The Honorary General Secretary shall, on or before the 7th of July of every year, send to each Local Branch a printed and numbered Ballot Paper, signed by the Hony. General Secretary or his nominee, containing the names of the candidates duly nominated for the Presidentship and Vice-Presidentships, and request the Branches to enter in it the number of votes obtained by each candidate, for the election of the President and Vice-Presidents, at a General meeting of the Branch, duly convened, and send the Ballot Paper in a sealed cover, by registered post, to the Headquarters to reach the same on or before the 16th of August of the same year, after which date it will not be valid.

On receipt of the Ballot Papers, the Hony. General Secretary will place, them before a Meeting of the Working Committee for scrutiny and counting of the number of votes, obtained by each candidate for declaring the results of the election on the basis of the number of votes secured by the condidates.

Votes of such Local Branches shall not be counted on whose account H.F.C. up to the end of the first half year has not been received in full, along with an up-to-date strength of Membership at the Headquarters on or before the 16th of August.

OLD BYE-LAWS (*Contd.*)

F. *Withdrawal of Nominations—*

The Returning Officer, after scrutiny of nominations, shall inform by registered post, the members whose names have been nominated for the offices of the President and three Vice-Presidents. Any of these members desiring to withdraw their names must inform the Returning Officer on or before the 20th June. Non-receipt of any reply in this respect by the 20th June will be interpreted as consent of the candidates concerned.

G. *Voting At Branches—*

The Returning Officer or his nominee shall on or before the 7th of July of every year, send under certificate of posting to each local branch a printed and numbered ballot paper signed by the Returning Officer or his nominee, containing the names of the candidates duly nominated for the Presidentship and Vice-Presidentships, and request the branches to enter in it the number of votes obtained by each candidate for the election of the President and Vice-Presidents, at a general meeting of the branch, duly convened, where the names of the contesting members shall be displayed or a sheet containing the names shall be distributed to members of the branch present and voting.

H. *Receipt of Ballot Papers from Branches—*

Each local branch shall send the ballot paper in a sealed cover by registered post to the Returning Officer at the Headquarters to reach the same on or before the 16th of August of the same year, after which date it will not be valid. Each local branch shall also send a certificate showing the number of members present and voting duly signed in the presence of the candidates or their accredited representative who shall be a member of IMA, if present.

I *Scrutiny of Ballot Papers—*

On receipt of the ballot papers, the Returning Officer will place them before a meeting of the Working Committee for scrutiny and counting of the number of votes secured by each candidate for declaring the results of the election on the basis of the number of votes secured by the candidates. The scrutiny shall be done by at least 3 members nominated by the Working Committee. The contestants or their accredited representatives who shall be members of IMA, can be present at the time of scrutiny of ballot papers and counting of votes.

Votes of such local branches shall not be counted on whose account H.F.C. for the 1st half year has not been received in full at the Headquarters along with an up-to-date list of membership on or before the 15th of May.

J. *Doubtful Points—*

The decision of the Returning Officer in the matter of doubtful points regarding application and interpretation of rules shall be final.

K. *Declaration of Election Results—*

The scrutineers shall compile the result of counting of votes and prepare a report which shall be presented to the Working Committee and after adoption, the President shall declare the members obtaining the highest number of votes respectively, duly elected as President, Senior Vice-President and two Vice-Presidents.

NEW BYE-LAWS AS PASSED (*Contd.*)

Bye-law—44

44. The following to be inserted as a new Bye-law as Bye-law 44 and renumber the subsequent Bye-laws :

"*Arbitration :*

44. If at any time any dispute is to be referred to arbitration, the arbitrator shall be the President of IMA and if he be involved himself, the Immediate Past President. The Arbitrator shall give an opportunity to both the parties to file their representation and if any party desires to be heard in person, the Arbitrator shall arrange the same and at the said hearing, the other party shall be allowed to be present if it so desires. The Arbitrator shall allow either party to put question to the other party to elicit the information provided the Arbitrator allows and provided that the question is in connection with the dispute before the arbitration.

The person once appointed as Arbitrator shall continue to be the Arbitrator till the dispute is settled even if his tenure of office gets over.

The Arbitrator shall give his award in writing and same shall be binding on all parties concerned. The expenditure incurred by Arbitrator shall be paid by the Headquarters of I.M.A. The expenditure incurred by the parties shall be borne by each party concerned."

Old Bye Law	44	renumbered	as Bye Law	45
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Branch Notes

ANDHRA PRADESH STATE BRANCH

The multifaceted activities of the State Branch were enumerated by Dr. K. Vasudeva Rao, Hony. State Secretary, in course of his annual report for the year 1971-72.

The State Branch lost the following distinguished members during the year : (1) Dr. H. M. Rao, Anantapur ; (2) Dr. K. Narayana Murthy, (3) Dr. J. V. Joshi, (4) Dr. K. Nagabhushanam, (5) Dr. V. Gopal Rao, and (6) Dr. R. K. Bhandari—Hyderabad ; (7) Dr. T. Kanaka Raju, Rajahmundry and (8) Dr. D. N. Appa Rao, Kakinada.

During the year under review the number of branches and the total number of members rose respectively from 40 and 1827 to 45 and 2271. The local branches held monthly refresher lectures and scientific talks for the benefit of general practitioners and seminars on public health topics. They also participated in programmes for medical examination of students. Of the local branches particularly four—Hyderabad, Masulipatam, Visakhapatnam and Guntur—recorded good progress. Among the memorial lectures organised by the State Branch the Arasthu Memorial Lecture was delivered on Diabetes Mellitus by Dr. Bajaj of the All-India Institute of Medical Sciences, New Delhi. In keeping with the decision of the State Working Committee to decentralise the Yerrapragada Subba Rao Memorial Oration lectures by holding the same in 3 University areas, Kurnool Branch was empowered to conduct the memorial oration this year. The arrangement for Dr. Gurumurthy Memorial Oration was also entrusted by the State Branch this year to the Visakhapatnam Branch. The first memorial lecture under this arrangement was delivered by Dr. Raghbendra Rao, Director of Medical and Health Services, A. P., on Future Planning and I.M.A.'s Roll in It. The Major Naidu Memorial Library was getting popular with the students and the Library Committee secured medical books worth Rs 100/- for use of undergraduate and postgraduate students.

The State Branch conducted a Family Welfare Orientation Course for private practitioners at Hyderabad. A large number of private practitioners from different parts of the State attended the course. The next course was scheduled to be held at Vijayawada to enable members from Guntur and Vishakapatnam Branches to attend the same in good numbers.

Dr. A. K. N. Sinha, President of I.M.A. (1971-72), visited the State and the local branches at Vishakapatnam, Kankinada, Vijayawada, Guntur, Hyderabad and Kurnool. The President addressed several largely attended meetings at the branches where he explained the stand of I.M.A. on various issues before the profession.

Dr. J. V. R. Sharma, President, and other office-bearers of the State Branch extended their unstinted support and co-operation in conducting the activities of the State Branch and the local branches.

East Godavari Branch—A meeting was held on 17-11-72 with Dr. D. Sundarasiva Rao in the chair. Dr. P S. Murthy Hony. Secretary, welcomed the members and the guests. Dr M. Venkateswara Rao, Additional Professor of Surgery, Rangarya Medical College, Kakinada, spoke on Surgical Management of Refractory Bronchial Asthma. Dr. D. V. Rao thanked the speakers.

Konaseema Branch—A meeting was held on 24-9 72 at Mummidivarum with Dr. A. Perisastri in the chair. Dr. L. G. Krishnayya, Professor of Medicine and Dr. M. Venkataswara, Additional Professor of Surgery, both from Rangaraya Medical College, spoke respectively on Rheumatalogical Disorders and Acute Intestinal Obstruction in Infancy and Childhood. Following them Dr. M. Vallabharao spoke on Infantile Diarrhoeas. Dr. P. Kondalrao, Joint Secretary, thanked the speakers.

A meeting was held on 23-10-72 at the local S.K.B. College. At the outset Dr. Perisastri, President, introduced six new members to the house—Drs. A. Raja Kumari, G. Venkataratnum, I. Leeser, P. Hanumanthrao, V. Bhaskararao and G. Sree Rama Raju. A brief discussion was held on a resolution moved by Dr. M. Subbarao requesting the State Branch to invite its Annual State Conference at Amalapuram. Following this the annual report of the branch for the year 1971-72 along with the financial statement was placed by the Hony. Secretary. The President then presented awards to Dr. E. B. Sankarum, Dr. E. L. Narasimham and Dr. K. Chinnamraju, Kottapeta, for the cent per cent attendance in the meetings held during the year.

The following were elected office-bearers and members of the working Committee : President—Dr. A. Perisastri ; Vice-President—Dr. K. Chinnamraju ; Hony. Secretary—Dr. G. Venkataratnum, Joint Secretary—Dr. E. B. Sankarum ; Representative of the State and Central Councils—Dr. B. Varahalu ; Members—Drs. P. Chiranjeeviraju, P. Krishnamraju, B. Varahalu, K. V. R. Dikshatulu and K. T. Rajarao.

Some members drew the attention of the house to their difficulties in receiving fees for the Family Planning operations for the last several months. The house requested the President to personally contact the D.M. & H.O., Kakinada, and see to the early payment of the dues.

In the clinical session Dr. G. Venkataratnum, Medical Officer in charge of the T.B. Clinic, Government Hospital, Amalapuram, gave a talk on Chemotherapy of Tuberculosis.

A meeting was held on 26-11-72 in the premises of Z. P. H. Boy's School. At the outset election of President and Vice-Presidents to the State Branch was conducted. Later Dr. P. H. Rao spoke on Surgical Treatment of Inguinal Hernia and Dr. J. Francis, Medical Officer, Razole, spoke on Experiences on Filariasis.

To cope with the situation arising out of the strike of Civil Assistant Surgeons and para-medical staff at the local hospital during anti-Mulki agitation, the branch opened a voluntary free medical clinic at Amalapuram on 24-12-72. Dr. Perisastri, President of the branch, informed the gathering at the opening ceremony that government doctors and their staff assisted by local private medical practitioners was running this free clinic and that they were promised help in cash or kind by various merchants' associations and pharmaceutical firms.

ASSAM STATE BRANCH

Margherita Branch—The annual general meeting was held on 9-1-73 at Margherita India Club with Dr. B. K. Goswami in the chair. Dr. S. C. Karmaker, Hony. Secretary, placed the annual report for the year 1971-72, which was adopted by the house. Dr. D. B. Ghose, Treasurer-cum-Social Secretary, presented the statement of accounts, which was also adopted. The following were elected office-bearers for 1972-73 ;

President—Dr. B. K. Goswami ; Vice-Presidents—Dr. S. M Deb and Dr. K. K. Chattopadhyay ; Hony. Secretary—Dr. S. C. Karmaker ; Treasurer-cum-Social Secretary—Dr. S. N. Mitra ; Members of Executive Committee—Drs. M. C. Khound, N. R. Deb and B. N. Baruah.

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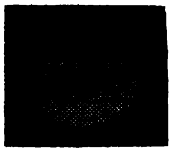

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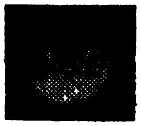

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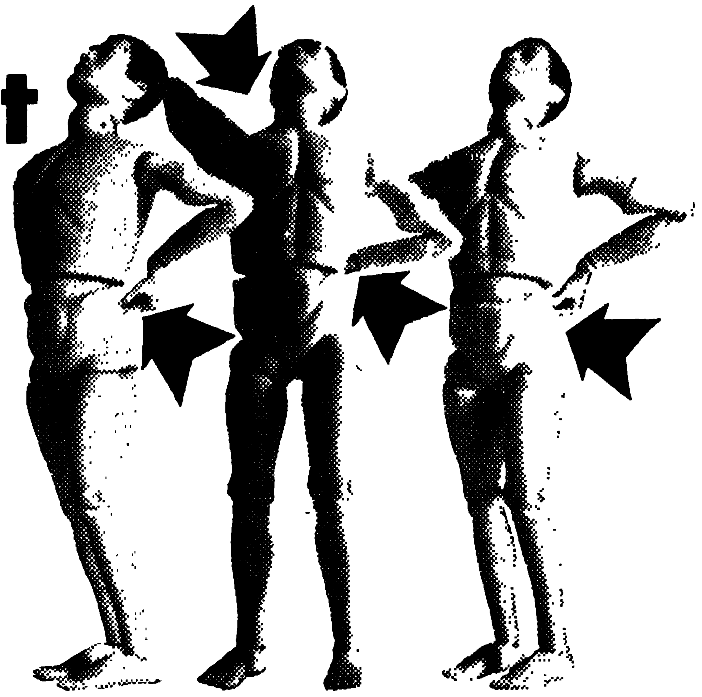

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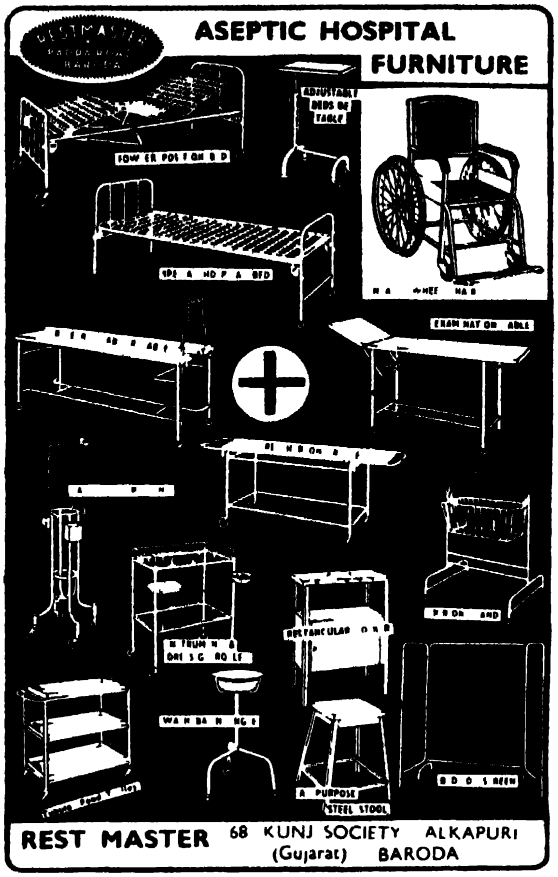

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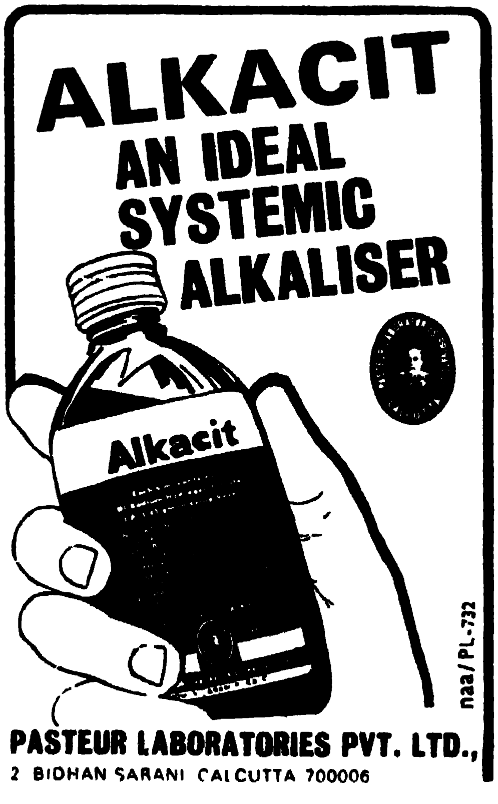

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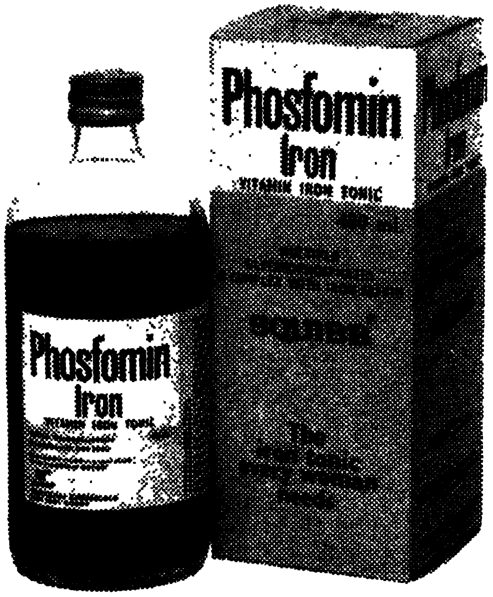

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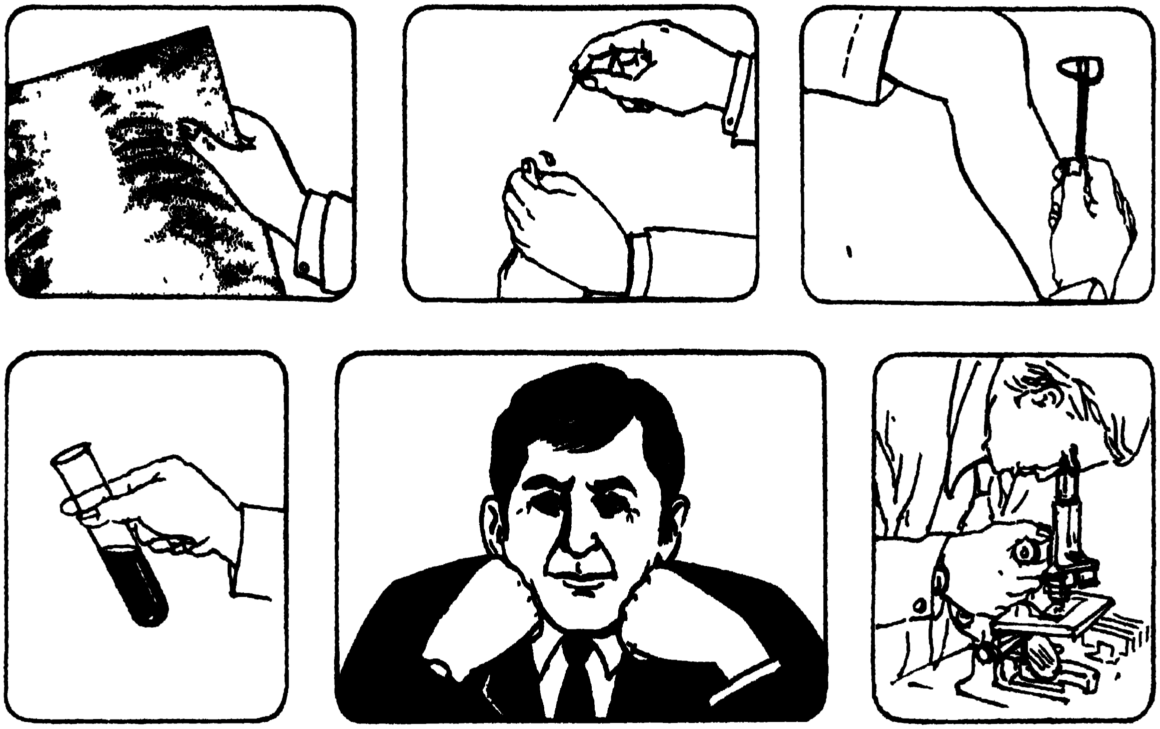

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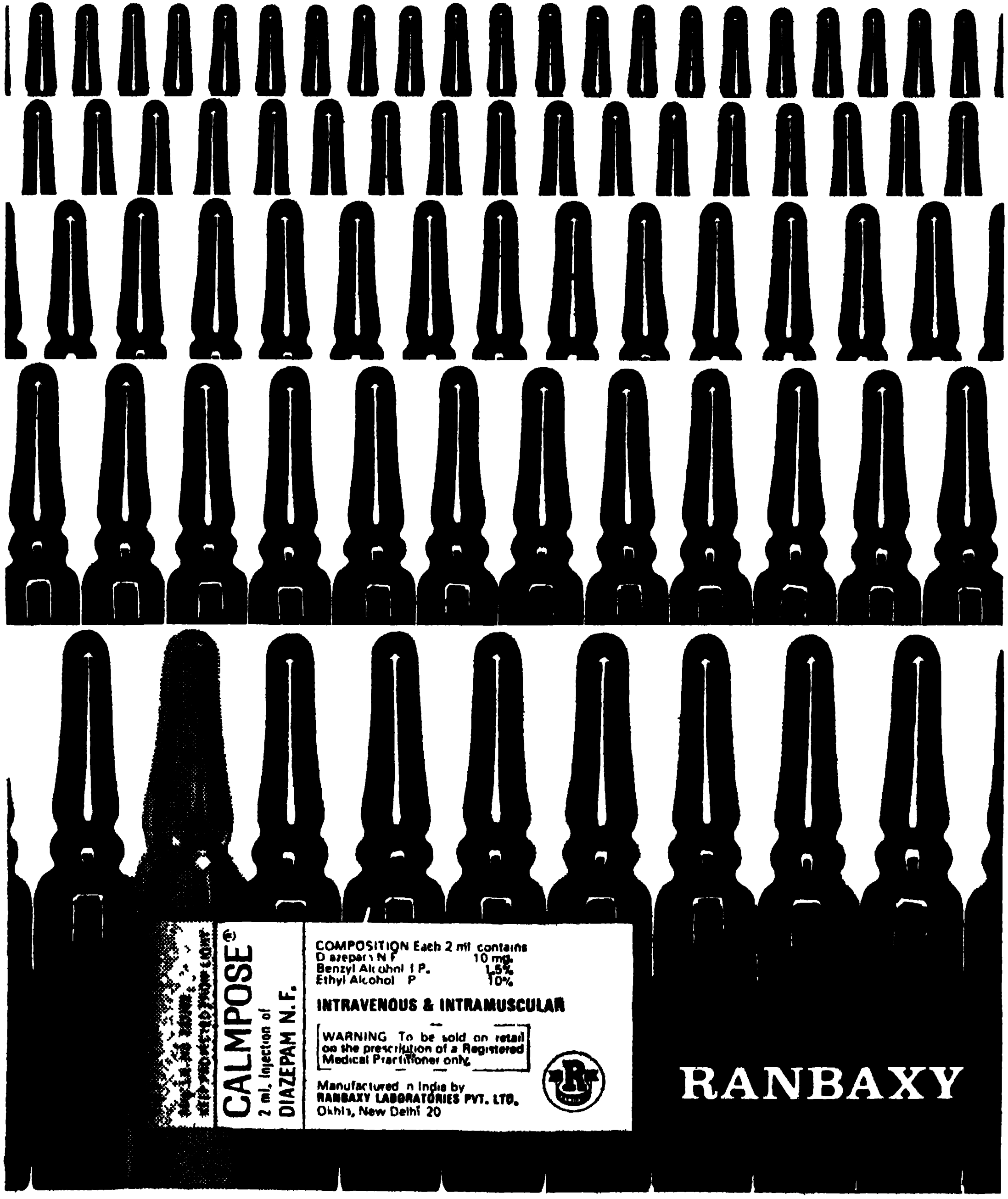
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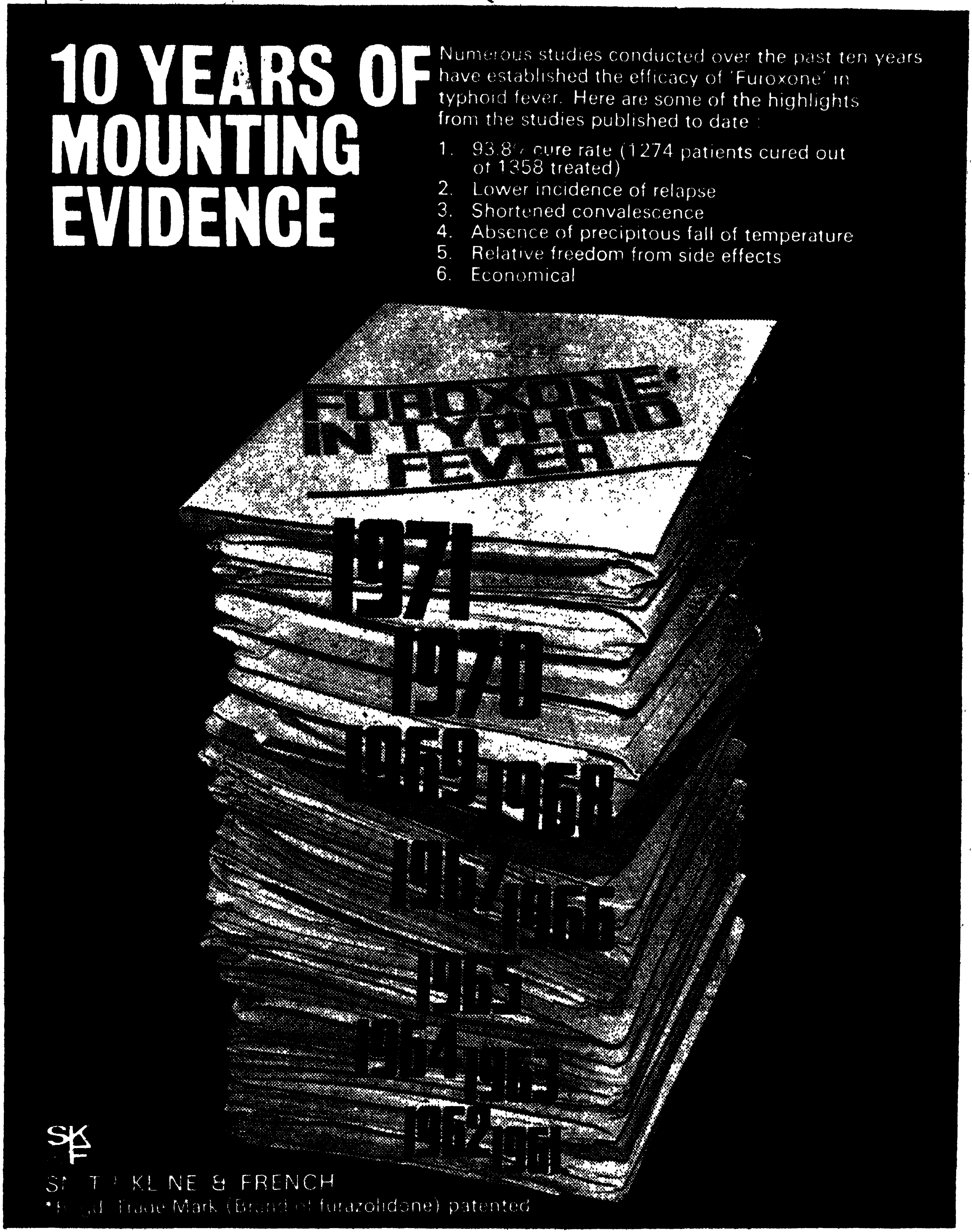

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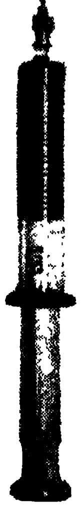

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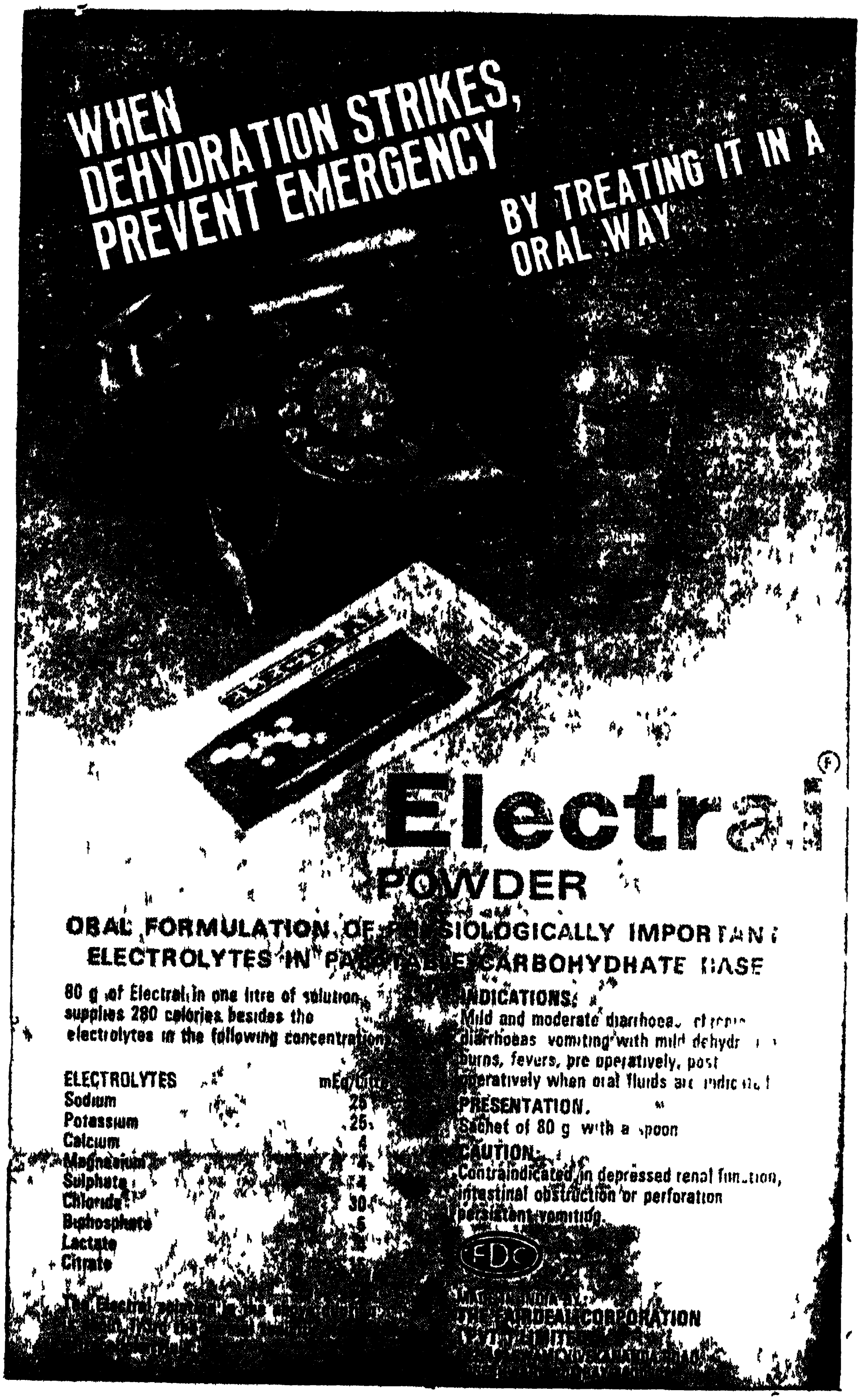

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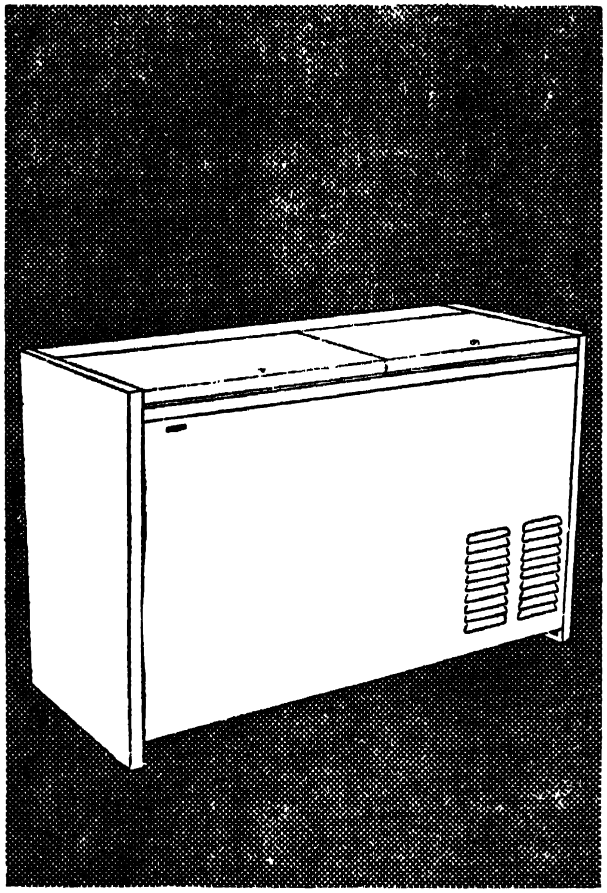

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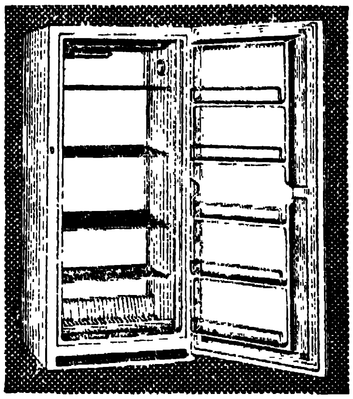
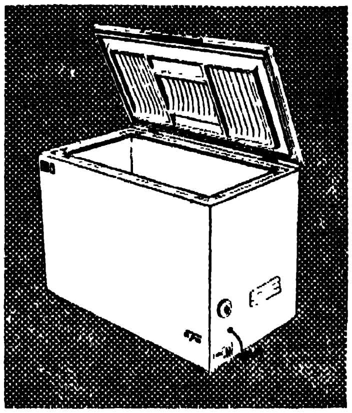


Suggestion 2: The Blue Star Leonard 275 litre vertical deep freezer



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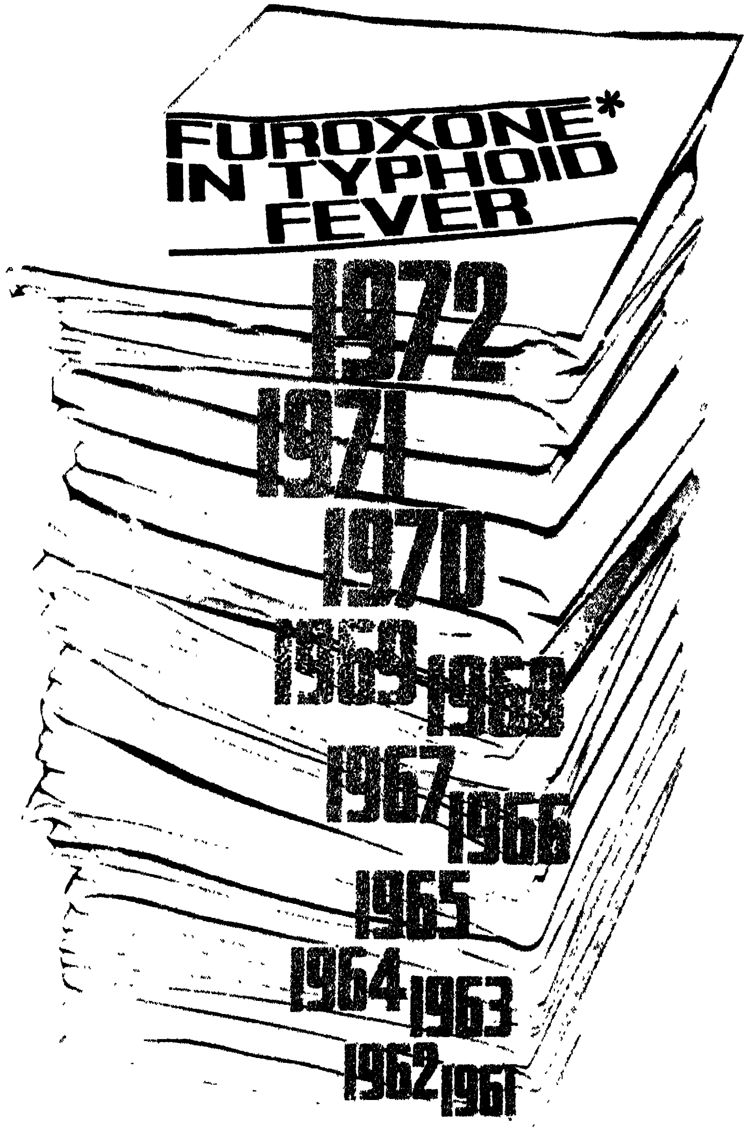

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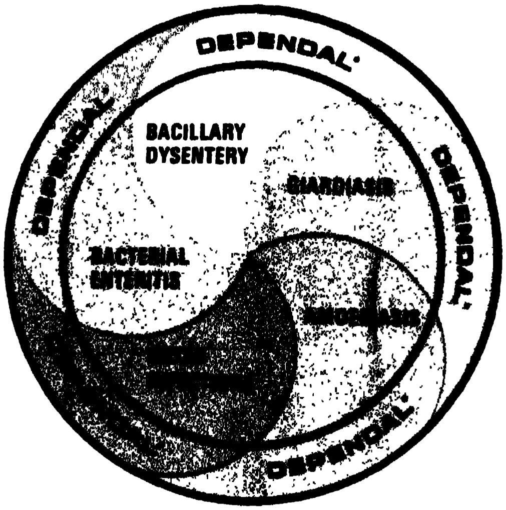

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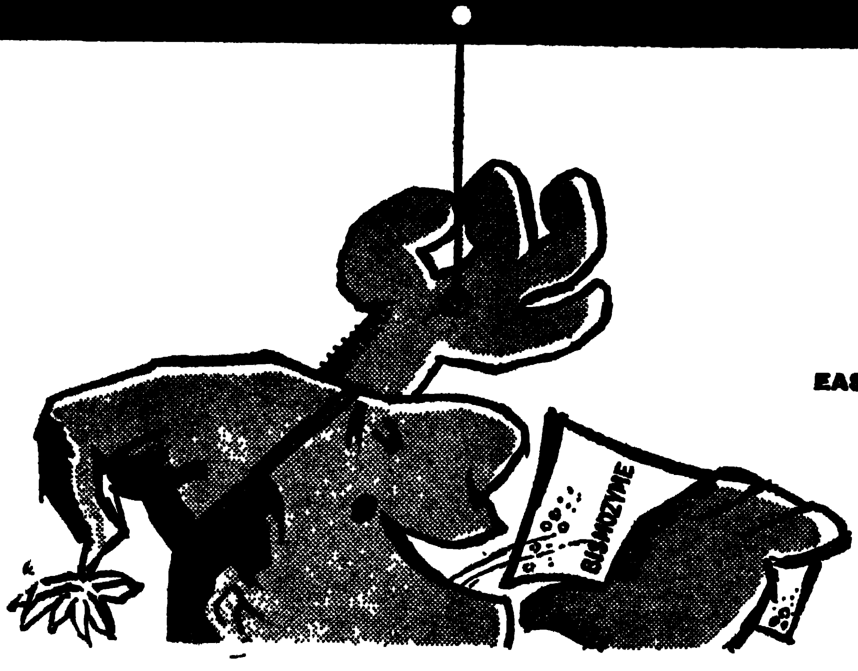

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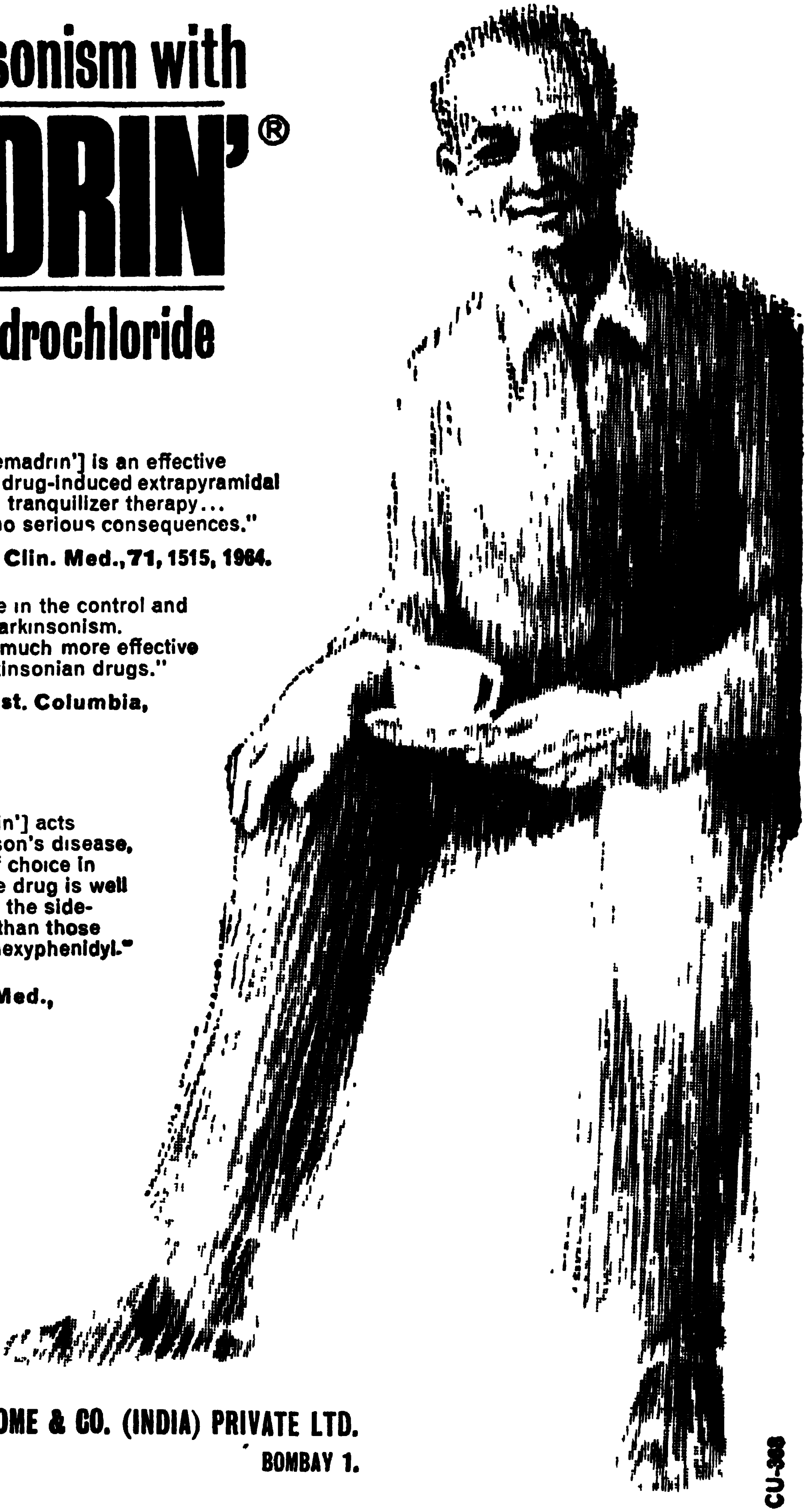

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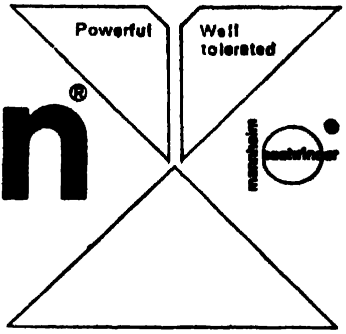

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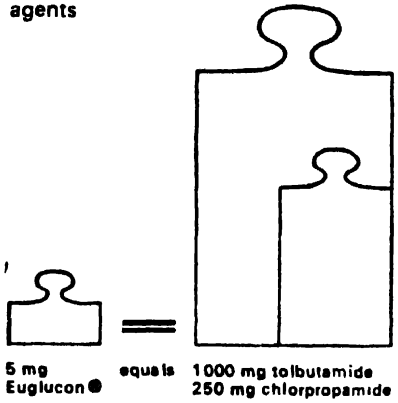

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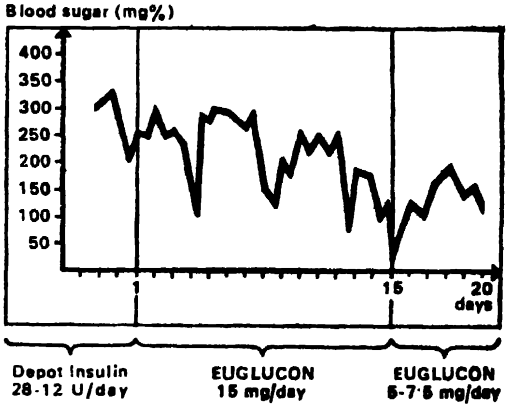

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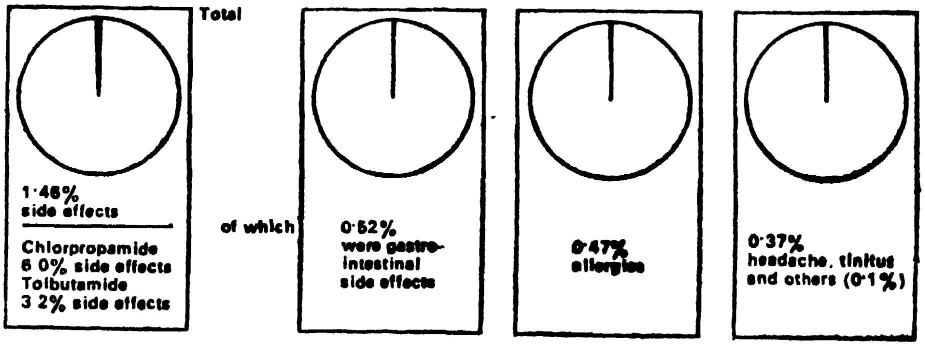

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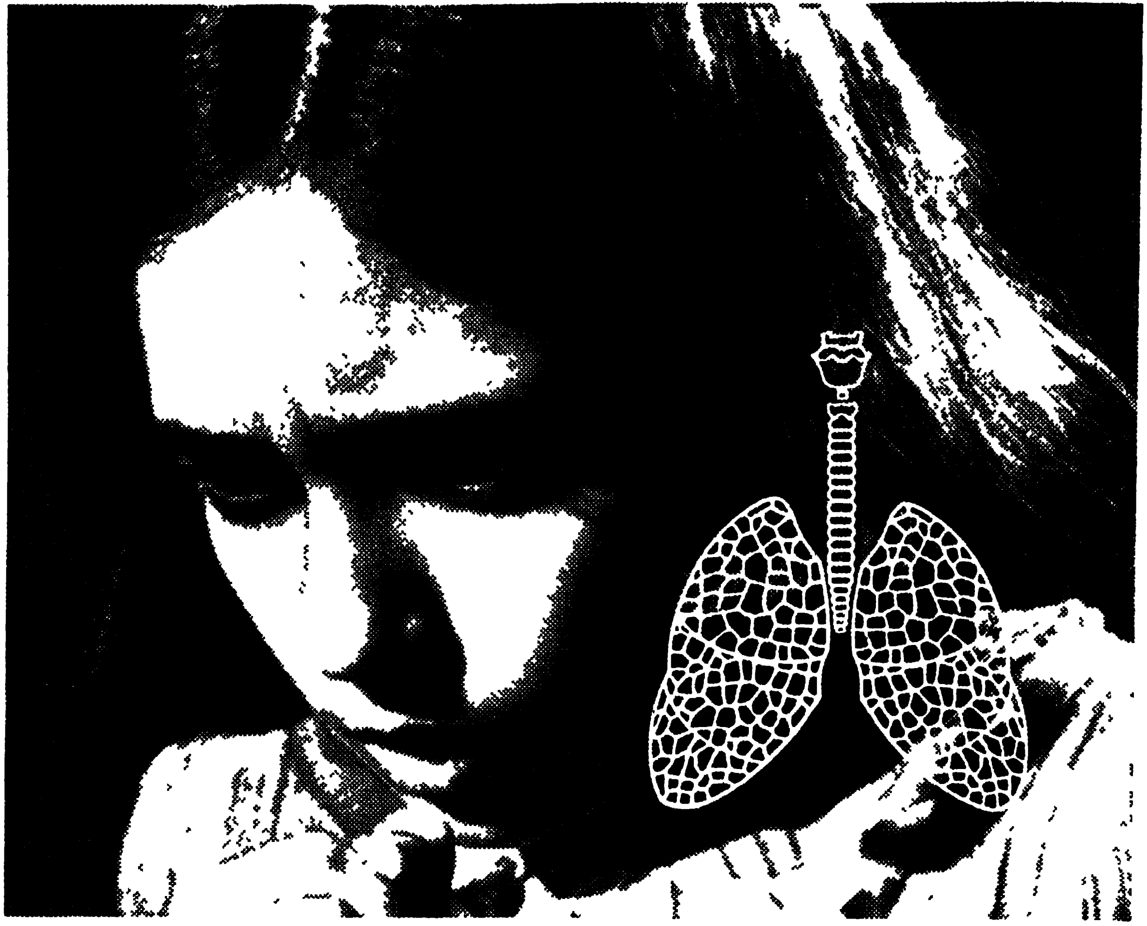

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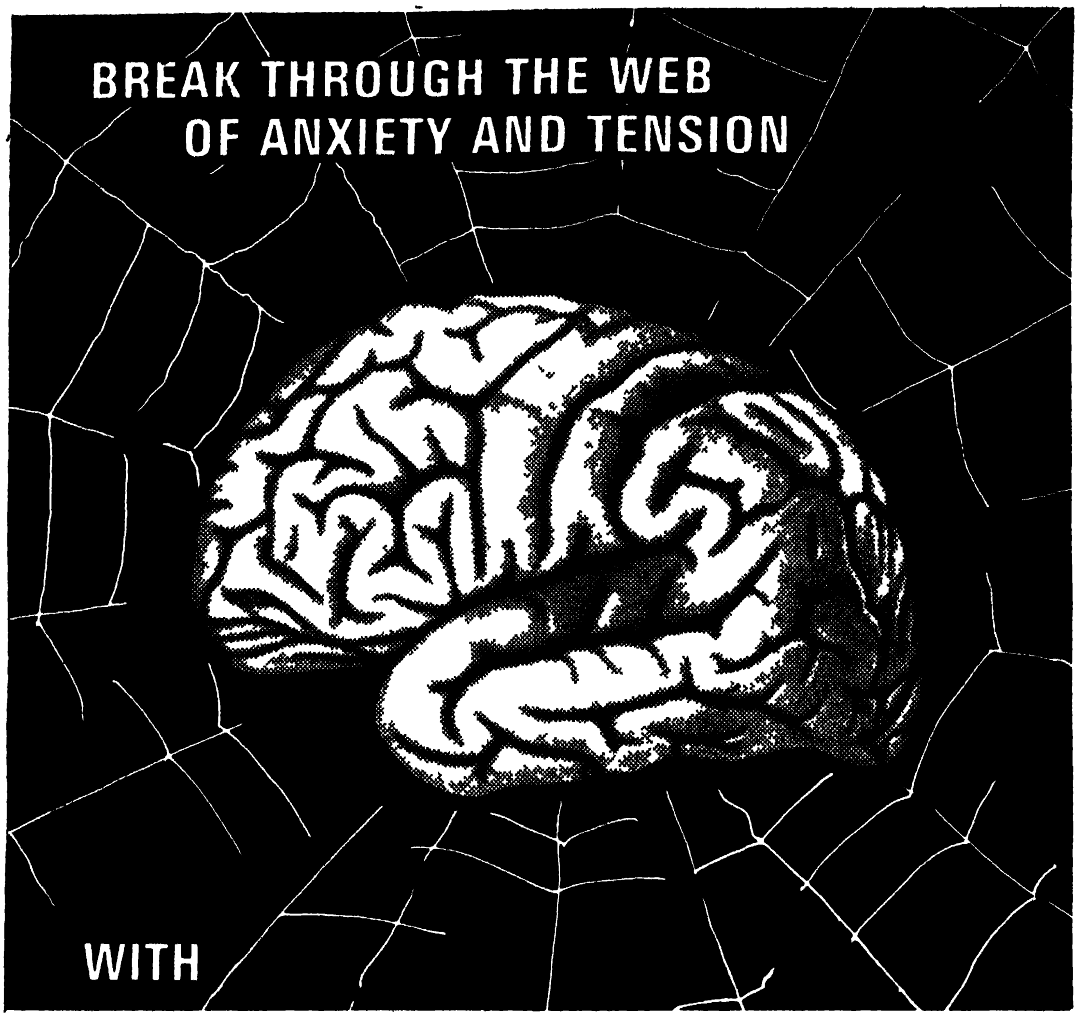

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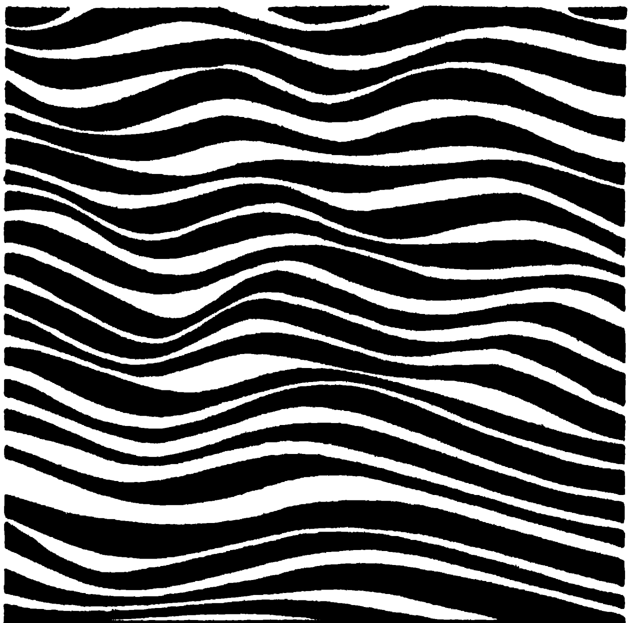

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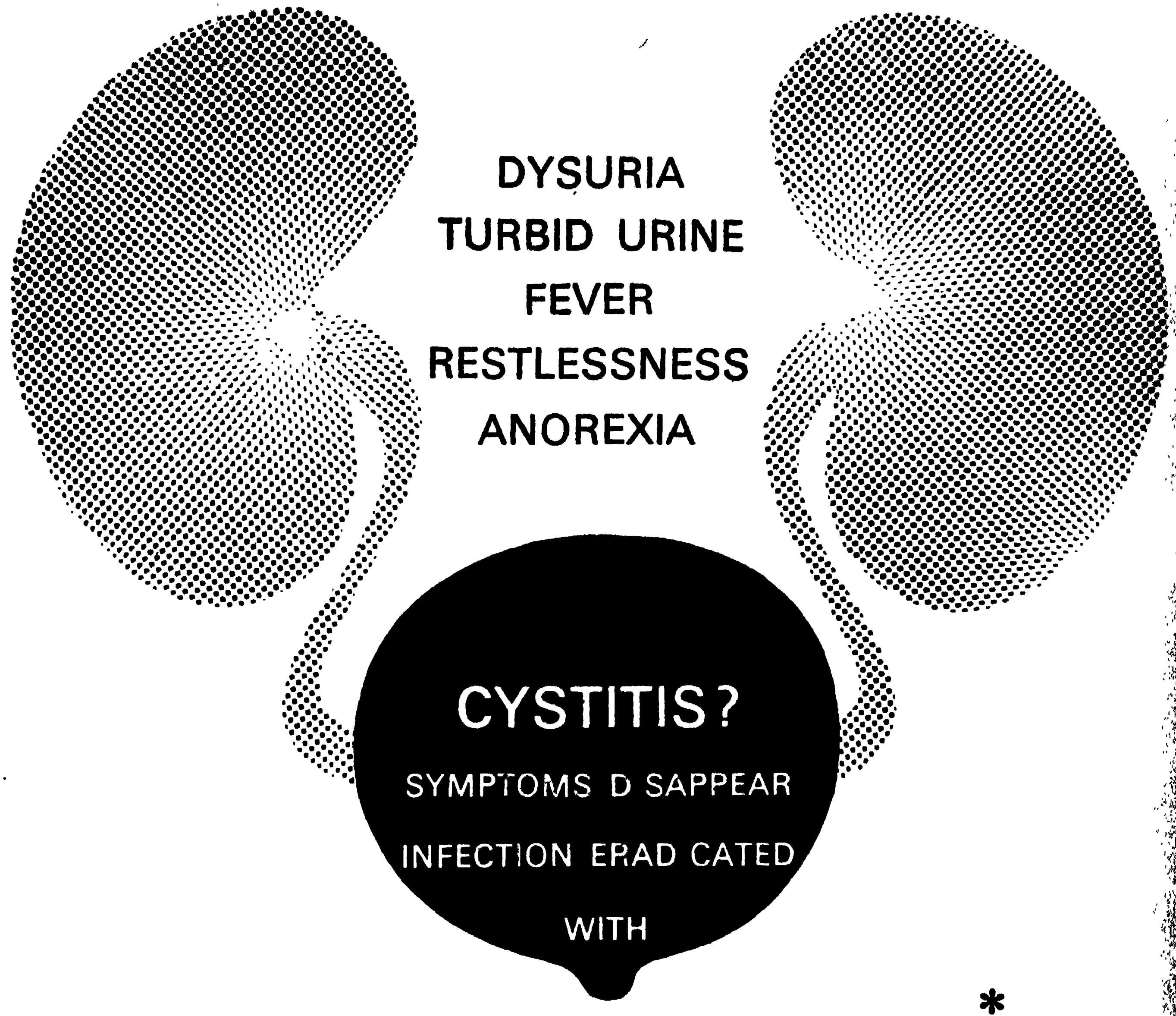

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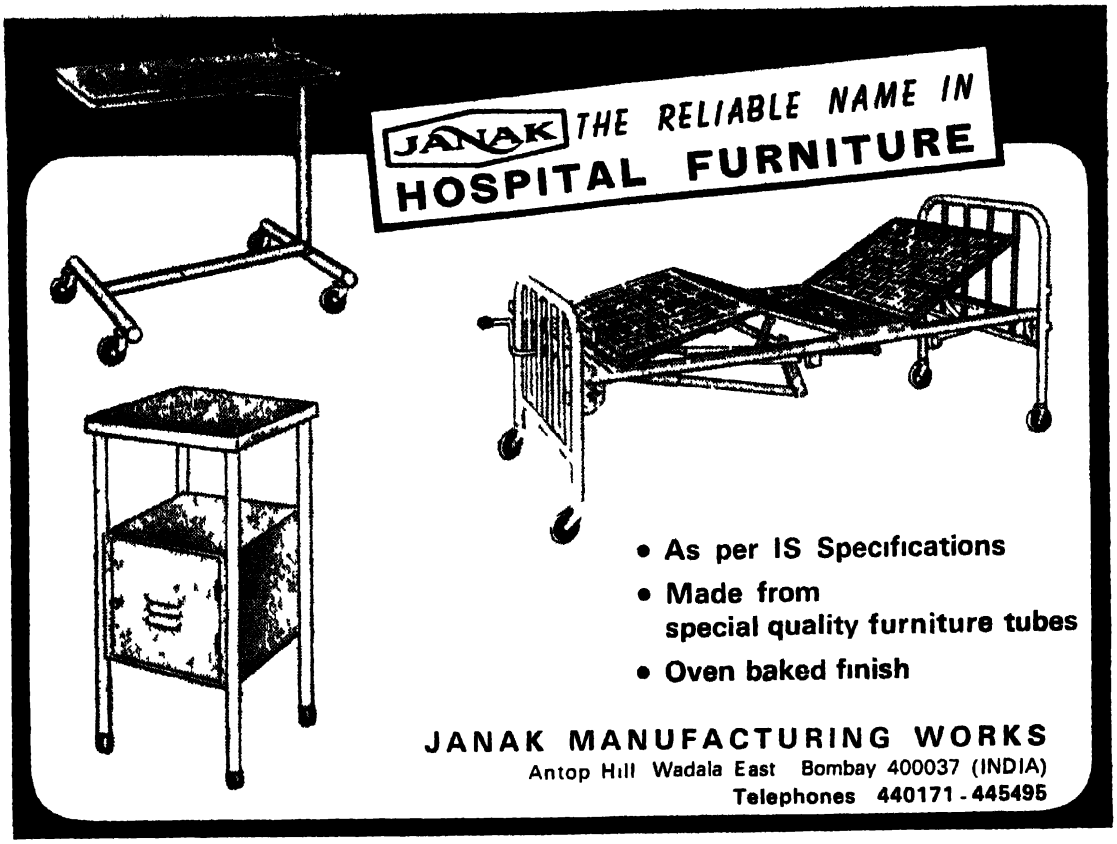

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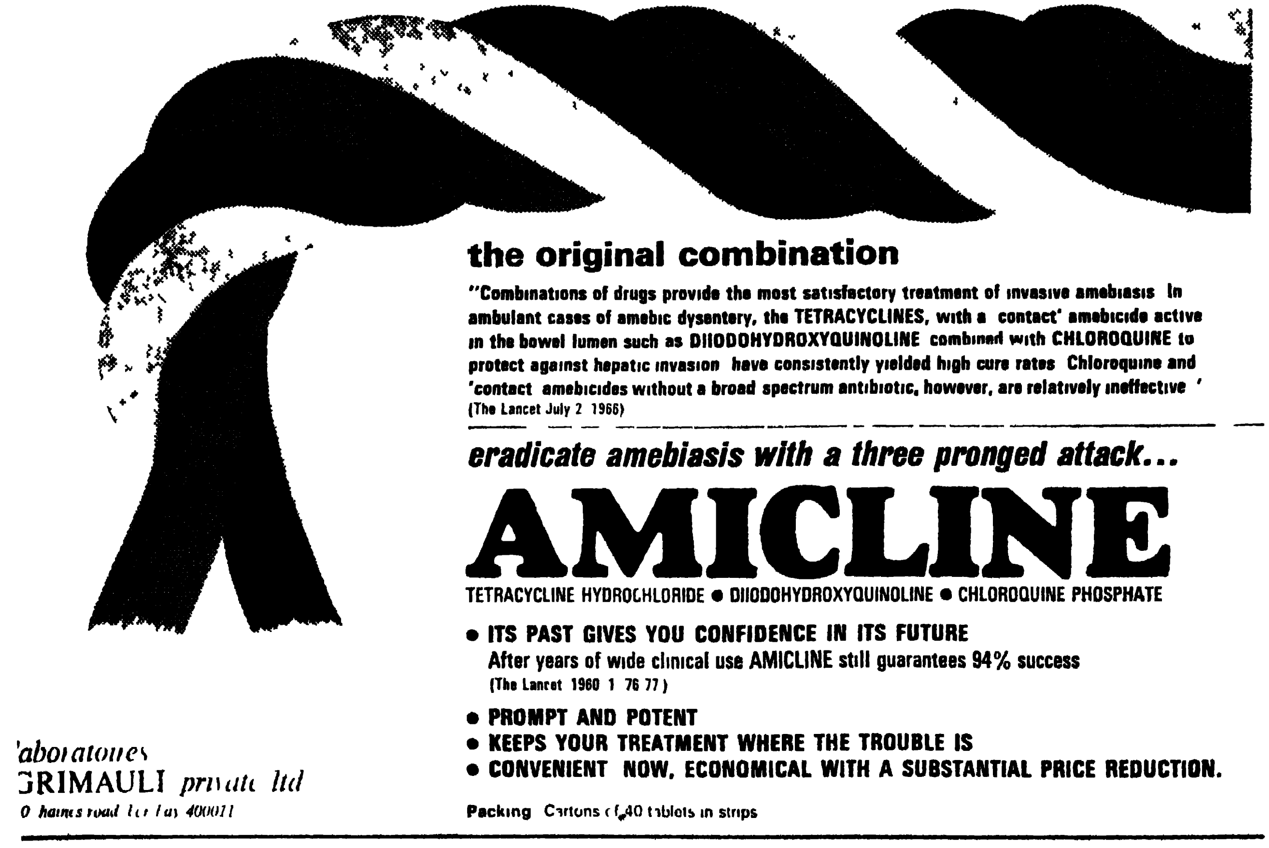

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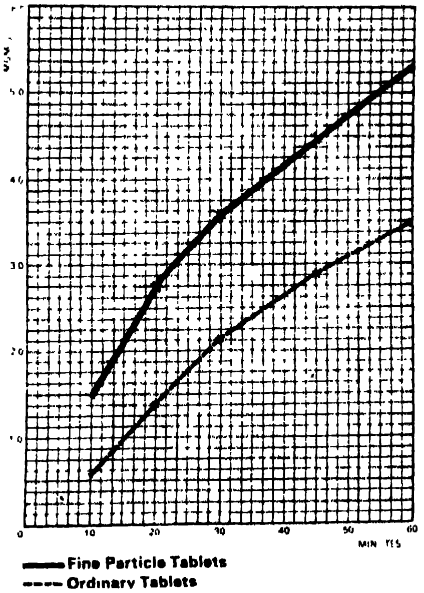

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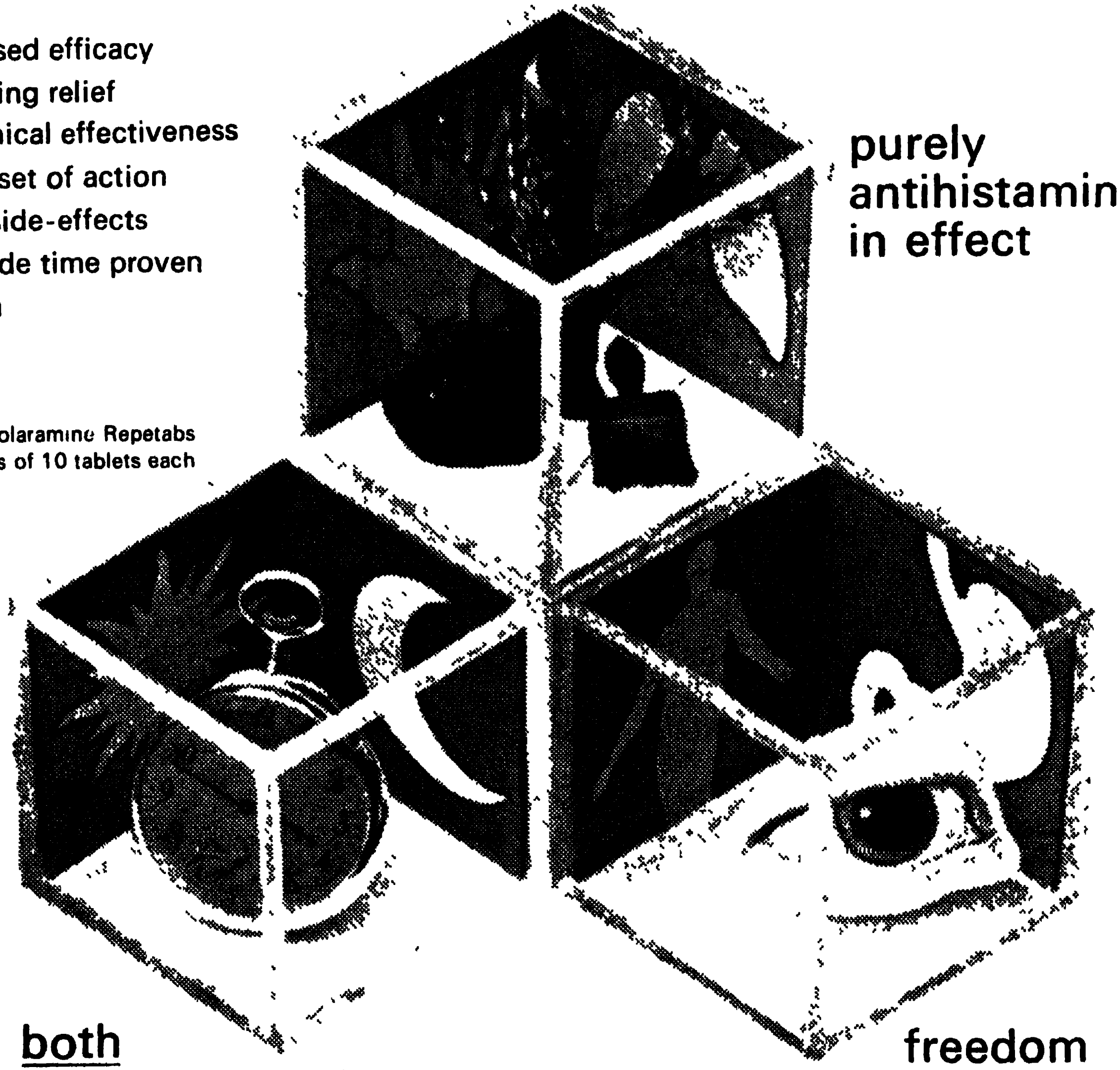

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CALCUTTA
AUGUST 16, 1973

ORIGINALS AND PAPERS

1

Clinical and Metabolic Profile in Diabetic Cardiovascular Disease

H. VAISHNAVA*, A. A. HAGROO**

[Received for publication July 3, 1973]

Cardiovascular and renal involvement in diabetes mellitus is mainly responsible for morbidity and mortality in the West. Even in this country, 40 to 56·7 per cent diabetics have been found to have one or more vascular complications as reported by various authors (Shah, 1965 ; Shah *et al.*, 1966 ; Mukerjee *et al.*, 1966 ; Urs, 1966 ; Banerjee, 1966) A comparatively low incidence of cardiovascular complications in such patients has been described in Yemenite Jews, Japanese, Jamaicans, South African Bantus, and Navajo Indians of the U.S.A. (Tulloch, 1962 ; Campbell, 1963 ; Gelfand and Forbes, 1963 ; Brunner *et al.*, 1964 ; Wada *et al.*, 1964 ; Saiki and Rimoni, 1968). In the tropics ketosis-resistant, insulin-dependent growth onset type of diabetes has been described in which the prevalence of cardiovascular complications is extremely low (DeZoysa, 1951 ; Tulloch, *loc. cit.* ; Vaishnava *et al.*, 1970). A relatively low prevalence of these complications has been reported in all Indian diabetics (Mitra and Chhetri, 1961 ; Pathania and Sachar, 1961 ; Urs, *loc. cit*, Vaishnava *et al.*, 1964 ; Vaishnava and Bhasin, 1969).

Vascular complications in diabetes mellitus have been described to be of two types : (1) Microangiopathy consisting of characteristic lesions in the small blood vessels ; (2) atherosclerotic lesions of the medium and large arteries (macroangiopathy).

DIABETIC MICROANGIOPATHY

This consists of intimal proliferation with thickening of the basement membrane and the presence of PAS-positive material in the small blood vessels. This type of vasculopathy is considered to be a characteristic feature of vascular disease in diabetes and is responsible for nephropathy, retinopathy, and possibly peripheral neuropathy and peripheral vascular calcification (Farguhar, 1959 ; Goldenberg *et al.*, 1959 ; Zacks *et al.*, 1962 ; Bloodworth, 1963). These changes are almost always absent in arteriosclerotic non-diabetic subjects (Ferrier, 1967).

Diabetic microangiopathy has been reported to vary between 46·3 to 73·9 per cent in the small vessels of the skin and muscles (Vaishnava *et al.*, 1967 ; Venkateshwar and Bhasin, 1969 ; Chhetri *et al.*, 1970). Goldenberg *et al.* (*loc. cit.*) and Pederson and Olsen (1962) reported it in 62 per cent of Western patients. These authors have not reported any positive correlation of microangiopathy of leg vessels with retinopathy and nephropathy and arteriosclerosis of larger arteries. Siperstein *et al.* (1968) found that 53·3 per cent of 30 genetically prediabetic subjects have microangiopathic changes in muscular capillaries. Yodaiken *et al.* (1969) also

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found a significant basement membrane thickening in the prediabetics and controls. They suggested that this finding could be a significant indication of prediabetes. Bhu *et al.* (1966) reported small blood vessel changes in 65 per cent subjects with chemical diabetes.

A positive correlation of the microangiopathy with the chronological age was seen, as all diabetics above 50 years of age showed it (Vaishnava *et al.*, 1966 ; Pederson and Olsen, *loc. cit.*). Aagenaes and Moe (1961) and Bercovici *et al.* (1964) noted pronounced changes in those who developed diabetes before the age of 40 years. Many workers have shown a total absence of correlation between the microangiopathy, and the duration, severity and the degree of control of diabetes (Zacks *et al., loc. cit.* : Pederson and Olsen, *loc. cit.* ; Vaishnava *et al.*, 1966 ; Siperstein *et al.*, 1970). But Foa (1971) observed a significant correlation between the duration of carbohydrate intolerance and the incidence and the degree of basement membrane thickening.

Despite uncertainty, as to the occurrence of change in the walls of the small vessels or in metabolites circulating through them prior to the onset of diabetes, the following possible concepts are evident: (1) The changes are produced by an underlying vascular disturbance which is genetically inherited with diabetes, their progression being completely or partially preventable by adequate insulin ; (2) the changes result from disturbed metabolism which can be controlled with insulin therapy; (3) a common abnormality, that is an auto-immune response to insulin or a precursor—is inherited and is responsible for both the disturbed metabolism and the vascular disease ; or (4) the metabolic and vascular components are inherited as separate abnormalities and run their course independently (Bradley, 1971). Siperstein *et al.* (1970) concluded that microangiopathy may be an independent consequence of the primary genetic lesion in diabetes or may represent the primary lesion, or even be an independent genetic lesion by itself. Vaishnava *et al.* (1966) pointed out that the metabolic changes of diabetes do not seem to run parallel with the changes in small blood vessels, but both these features may be the different facets of the same fundamental disorder.

Factors responsible to produce microangiopathy are: (a) Impairment of circulatory flow in the terminal vessels leading to prolonged hypoxia and undernutrition of the endothelium. It also leads to neovascularisation in diabetic retinopathy (Ashton, 1963 ; Ditzel, 1968) ; (b) a metabolic disorder of simple polysaccharides (glycogen) or complex polysaccharides (mucopolysaccharides) or both, involving basement membranes of capillaries and ground substance of connective tissue (Ditzel, *loc. cit.*). Various metabolic abnormalities seen in microangiopathy are as follows: 1. Serum proteins: Lowered albumin values with increase in alpha-2 and beta globulins have been demonstrated in association with nephropathy especially in Kimmelstiel-Wilson syndrome (Schneider *et al.*, 1946 ; Ejarque *et al.*, 1959 ; Winzler, 1964). Increase in gamma globulin levels has been observed when the duration of the disease was more than 5 years (Sikka *et al.*, 1968 ; Biswakumar and Singh, 1969). 2. Protein-bound carbohydrates (mucopolysaccharides, glycoproteins and glycolipids): Elevation of mucoprotein fraction and glycoprotein has been repeatedly found in diabetics (Winzler, *loc. cit.*). The marked increase of protein-bound carbohydrate in diabetic nephropathy is predominantly seen in alpha-1 and alpha-2 protein fractions. Main features in the behaviour of these substances in diabetic subjects are: (a) Higher levels of total and alpha-2 protein-bound carbohydrate ; (b) wider range of these levels than in normals ; (c) rising levels of hexoses bound to serum protein with extensive vascular lesions ; (d) tendency for increased protein-bound carbohydrate to be reversible early in the course of the disease and to become permanent when vascular disease like nephropathy is established (Bradley, 1971).

Protein-bound carbohydrates are primarily found in the ground substance and basement membrane of normal people. Abnormal amounts have been demonstrated in blood vessels of the retina (Friedenwald, 1950), kidney (McManus, 1950) and other tissues (Warren *et al.*, 1959) of diabetics. The implications of increased synthesis of glycoproteins in diabetics seem to be: (a) Deposition in blood vessel walls might lead to vascular lesions, but normal and diabetic glomerular basement membranes contain galactose and glucose as the principal hexoses (Lazarow and Speidel, 1964) whereas serum glycoproteins contain galactose and mannose (Winzler, *loc. cit.*); (b) these may be abnormal glycoproteins, but no relative differences have been noted among sera of diabetics and normals (Sommers *et al.*, 1955); (c) liberation of glycoprotein from damaged blood vessel walls or a non-specific host reaction to vascular disease appear unlikely (Winzler, *loc. cit.*) and (d) increased glycoproteins may be formed in the microvasculature (Spiro, 1969).

The relationship of vascular disease to inadequate utilisation of glucose along insulin-dependent pathways are studies of serum beta-glucuronidase levels in diabetics and normals (Ditzel and Moinet, 1959 ; Hagenfeldt and Wahtherg, 1965; Miller *et al.*, 1966). Significantly increased serum levels have been found in diabetics but generally highest in patients with a long duration of the disease and in those with evidence of atherosclerosis. These authors suggested that the higher enzyme activity might reflect an increase in the non-insulin dependent glucuronic acid cycle for the disposal of excessive glucose. This points that increased enzyme activity is an indication of increased mucopolysaccharide and glycoprotein formation as a result of increased activation of this pathway.

It has been suggested that microangiopathy may be an antigen antibody reaction induced by insulin (Gellman *et al.*, 1958 ; Berns *et al.*, 1962; Blumenthal *et al.*, 1966). But typical lesions have also been reported in diabetics never treated with insulin (Freedman *et al.*, 1960). Whether this reaction is a cause of microangiopathy or a by-product of the diabetes is still to be determined.

Vaishnava *et al.* (1966, 1967) have observed an increase in free fatty acids, beta-lipoproteins and lipid phosphorus in diabetics as compared to the controls, the rise being more marked in diabetics with vascular complications especially Kimmelstiel-Wilson syndrome; but this lipid profile did not show any correlation with microangiopathy. Similar observations have been made by Sinha and Ghosh (1960) and Mathur *et al.* (1961).

ATHEROSCLEROSIS (MACROANGIOPATHY)

Factors which in the diabetic may account for the increased incidence, extent and severity of atherosclerosis could be: (1) Clinical atherosclerotic vascular disease is significantly influenced by the associated presence of microangiopathy ; (2) hyperglycaemia is related to or indicative of deposition or increased formation of simple or complex polysaccharides (LeCompte, 1955 ; Randerath and Diezel , 1959 ; Spiro, 1969) in the arterial wall ; and (3) diabetes increases the frequency of factors associated with enhanced atherogenesis, such as hypertension, hyperlipaemia and decreased fibrinolysis.

Various workers believe that microangiopathy does account for the increased severity of atherosclerosis (Havel, 1964 ; Herman and Gorlin, 1965). It is clear that the disease in small vessels may intensify disease in large vessels by impairing microcirculatory blood flow with increased intraluminal pressure and/or by involvement of *vasa vasorum* in the larger muscular arteries (Bradley, 1971). Yodaiken *et al.* (*loc. cit.*) have not found any clinical relationship between microangiopathy and atherosclerosis.

An association between hyperglycaemia and atherosclerosis is well documented (Hirsch *et al.*, 1953). Elevations of protein-bound carbohydrates, as seen in microangiopathy, have not been demonstrated in atherosclerosis, nor is there any relationship between hyperglycaemia and atherosclerosis (Frankl, 1964).

ASSOCIATED DISEASES

Although yet unsettled, most data appear to show a relationship between diabetes and hypertension. An incidence of 38 to 57·5 per cent has been reported by Western workers (Pell and Alonzo, 1967), whereas Indian workers reported it in 19·4 per cent patients (Vaishnava and Bhasin, 1969). The frequency increases with the duration of diabetes (Martensson, 1950 ; Pathania and Sachar, *loc. cit.* ; Shah, 1965 ; Vaishnava and Bhasin, 1969). Obesity, as a significant factor in the high incidence of small and large vessel disease, has been demonstrated in a long-term follow-up of 1500 diabetic patients (Buschman *et al.*, 1959 ; Shah *et al.*, 1966 ; Vaishnava *et al.*, 1968).

METABOLIC :

Lipid metabolism—A positive correlation between serum lipids and vascular disease is generally accepted, but the role of lipid abnormalities in the aetiopathogenesis of vascular disease is still controversial. Mathur *et al.* (1961) found elevated serum lipids in all diabetics without any significant correlation with the duration of diabetes or severity of the disease. Mathew *et al.* (1969) reported markedly elevated β-lipoprotein ratio in all diabetics with vascular complications as compared to the non-complicated and control subjects. Vinod Kumar *et al.* (1971) found elevated levels of serum triglycerides, pre-β-lipoproteins and $\beta:\alpha$ ratios in patients with these complications. They did not find any alteration in the lipoprotein lipase levels. The duration of diabetes, mode of treatment, and the degree of control did not have any significant role in determining the presence of vascular disease. These authors concluded that hyperlipaemia seems to be of endogenous origin, manifesting as hyper- pre-β-lipoproteinaemia and hypertriglyceridaemia. The changes in circulating lipid fractions do not indicate that atherosclerosis is accelerated or microangiopathy is produced as a result of hyperlipaemia (Ricketts, 1955). Specific fractions found to be elevated in uncontrolled diabetes are : Abnormal lipoproteins (Tuller *et al.*, 1954 ; Kolb *et al.*, 1955), esterified fatty acids (Hirsch *et al.*, *loc. cit.*) cholesterol and phospholipids (Harris *et al.*, 1953), triglycerides (Albrink *et al.*, 1958), nonesterified fatty acid (Gordon and Cherkes, 1956) and chylomicrons (Finley, 1961). Bagdade *et al.* (1967) demonstrated that uncontrolled diabetes is associated with Type I hyperlipoprotaeinemia, whereas in patients apparently free of atherosclerosis or microangiopathy, circulating lipid levels were normal despite the liberal fat intake (Bagdade *et al.*, *loc. cit.*).

Carbohydrate metabolism—Transient hyperglycaemia, using G.T.T. or prednisolone-primed G.T.T., has been observed in 52 to 100 per cent patients after acute myocardial infarction (Ahuja *et al.*, 1965 ; Datey and Nanda, 1966 ; Mathur *et al.*, 1969), whereas 41 to 78 per cent prevalence of high blood sugar during acute myocardial infarction has been reported by Western workers (Waddell and Field, 1960; Puttanna, 1966). Samani (1963) observed a mild diabetic type of G.T.T. in 75 per cent of diabetics with IHD and has suggested that mild diabetics are more prone to this complication. Sowton (1962) and Datey and Nanda (*loc. cit.*) observed hyperglycaemia in myocardial infarction in 71, 47 and 27 per cent patients immediately after the attack, 1 month after and 1 to 3 years after, respectively. The authors have suggested that myocardial infarction unmasks latent diabetes in some patients and that initial normoglycaemics are unlikely to develop diabetes later.

Fibrinolytic activity—Blood fibrinolytic activity was found to be lower in diabetes than in age-matched controls. Fibrinolytic activity did not correlate with the duration of diabetes, choleserol level, or blood glucose level. This decreased fibrinolysis has been blamed for increased atherosclerosis (Fearnley *et al.*, 1963 ; Baggchi *et al.*, 1970). However, Gupta and Joseph (1969) found significant correlation between serum cholesterol and serum fibrinolytic activity. The combined views of phenformin and ethyloestrinol has been shown to cause increase in fibrinolysis and reduction in platelet stickiness ; when given alone this effect is not observed (Fearnley *et al.*, 1967). But this observation needs further confirmation.

CLINICAL :

Ischaemic heart disease—IHD is considered to be the most common cause of morbidity and mortality in diabetes mellitus. Western observers have found a higher incidence of this complication, i.e., 14 to 74 per cent (Root *et al.*, 1939 ; Stearns *et al.*, 1947 ; Bradley and Bryfogle, 1956). Indian literature on clinical studies have shown a comparatively low incidence varying from 7·29 to 33·3 per cent (Patel and Dhirwani, 1959 ; Pathania and Sachar, *loc. cit.* ; Sinha and Ghosh, 1960 ; Vaishnava *et al.*, 1964 ; Vaishnava *et al.*, 1966). Clinical and/or resting electrocardiographic prevalence of this complication varies from 7·5 to 35 per cent (Vaishnava *et al.*, 1964 ; Ahuja and Tandon, 1966 ; Pathania and Sachar, *loc. cit.*), which is comparatively lower than that reported in Western literature (Bradley and Bryfogle, *loc. cit.* Lundback, 1954). Latent IHD in diabetics as revealed by the Master's double step test is 17·5 per cent as reported by Vaishnava *et al.* (1968), which is in accordance with that reported by Samani (1963). Many workers have reported increasing prevalence of atherosclerotic heart disease with the rising age of diabetics (Shah, *loc. cit.* Malhotra and Pathania, 1968). Ricketts (*loc. cit.*) reported an equal incidence of IHD in diabetics in both the sexes, while Dunlop (1954) thought that females predominate. Indian studies have not shown any predilection for any sex (Vaishnava *et al.*, 1968 ; Pathania and Sachar, *loc. cit.*). These authors believe that diabetes removes the relative immunity against atherosclerotic vascular involvement in women.

Silent myocardial infarction has been described to be more frequent in diabetics especially with long standing disease, the reported incidence varies from 24 to 60 per cent (Bradely and Schnfel, 1962 ; Agar, 1962 ; Banerjee, 1966). ECG studies have not shown any special predilection for any region (Sanyal and Mitra, 1956). In the diabetic patient the abrupt onset of congestive cardiac failure with or without pain should always raise the question of infarction as the precipitating cause (Bradley, 1971).

Hypertension—Increased frequency of hypertension among diabetics is yet uncertain, but most data appear to show a relationship between diabetes and hypertension. Western literature reports an incidence of 38—57·5 per cent (Wetherby, 1932 ; Edeiken, 1945), whereas, Indian authors reported an incidence varying from 13·3—45·3 per cent (Shah *et al.*, 1968 ; Vaishnava and Bhasin, 1969 ; Banerjee, *loc. cit.*). Hypertension is more frequent in the older age-group diabetes as observed by Vaishnava and Bhasin (1969) and Pathania and Sachar (*loc. cit.*) and Wig *et al.* (1953). These authors have reported hypertension in diabetics which was almost equally distributed between the two sexes. This complication seems to be more common in patients with diabetes of longer duration (Lall and Bahl, 1967). Kimmelsteil-Wilson (KW) syndrome and pyelonephritis, contribute to hypertension in about 10-20 per cent cases. Associated IHD, cerebrovascular accidents and retinopathy are more frequently seen in hypertensive diabetics (Freedman *et al.*, 1958 ; Vaishnava and Bhasin, 1969 ; Pathania and Sachar, *loc. cit.*).

Diabetic nephropathy—K-W syndrome has been reported in 2—14 per cent of Indian diabetics (Koshy *et al.*, 1966 ; Urs, *loc. cit.* ; Mukerjee *et al.*, *loc. cit.*), whereas, Thomsen (1965) reported an incidence of less than 1 per cent in Western population. The majority of the patients had diabetes for more than 5 years and showed a good correlation between the duration and K-W syndrome. Constant proteinuria, which is the hallmark of nephropathy was found to be associated with some degree of glomerulosclerosis in 75 per cent of the diabetics (Thomsen, *loc. cit*). Gellman *et al.* (1959 a, b) found that progressive worsening of the clinical manifestations of the K-W syndrome correlated well with the diffuse glomerulosclerosis, rather than with the

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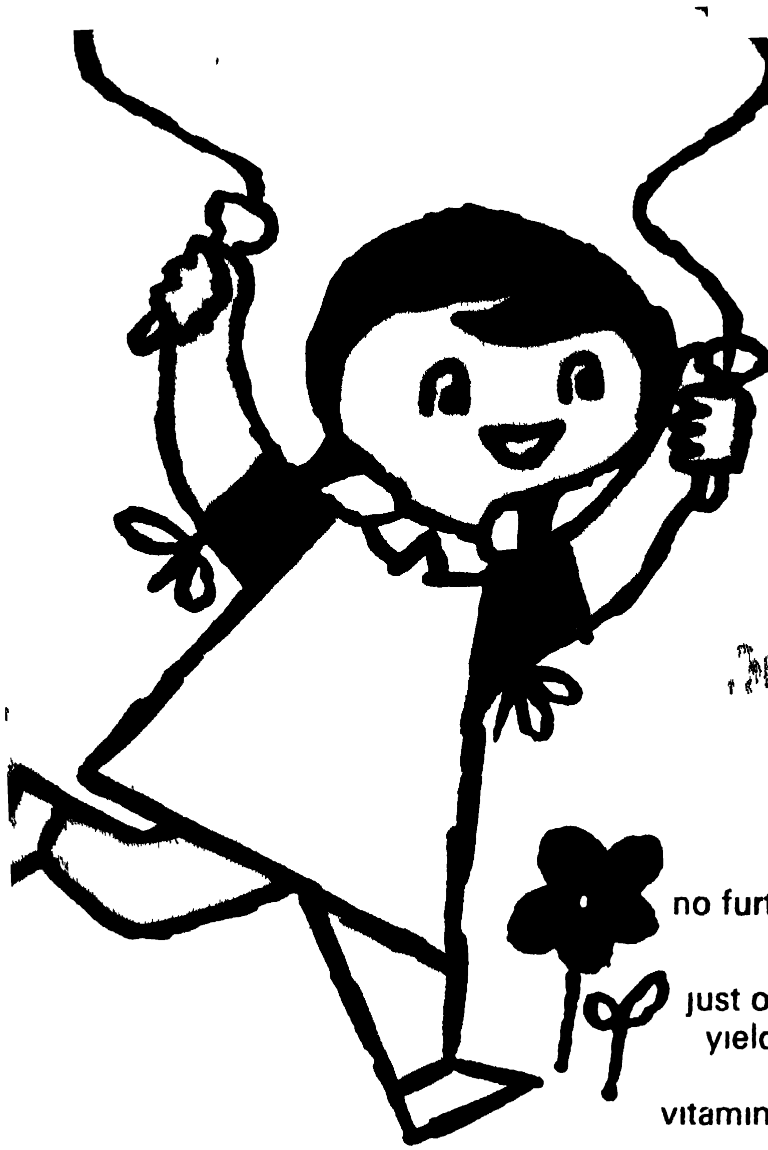

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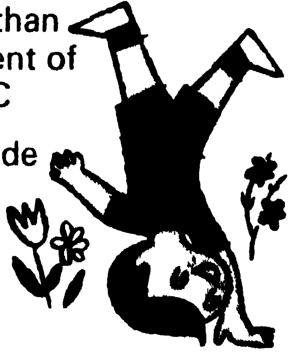

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nodular lesions. They also observed a close relationship between diffuse lesions and elevated blood pressure, proteinuria and increased serum creatinine levels. Indian workers have reported diffuse glomerulosclerosis in 42—90 per cent (Gupta and Chakravarti, 1964; Mathur *et al.*, 1960) The renal lesion has no direct relationship with the severity of diabetes or its duration (DeZoysa, *loc. cit.* Gupta and Chakravarti, *loc. cit.*; Mathur *et al.*, 1964; Vaishnava *et al.*, 1971). Mathur *et al.* (1964) found intercapillary glomerulosclerosis in 31 out of 32 patients; 23 had diffuse lesions, 4 had diffuse and exudative lesions and 2 had a combination of diffuse, nodular and exudative lesions. They observed nodular lesions in older patients with longer duration diabetes and concluded that the diffuse lesion is the first to appear. Mathur *et al.* (1967) reported normal renal function in 27 out of 31 cases with renal lesions and concluded that renal function tests have no correlation with the histological picture.

Cerebrovascular disease—The prevalence of cerebrovascular diseases ranges from 1·7 to 17·1 per cent (Larson, 1967; Ahuja and Tandon, *loc. cit*; Mukerjee *et al.*, *loc. cit.*). Vascular insufficiency and cerebral thrombosis have been claimed to be associated with atherosclerotic lesions. Intracerebral haemorrhage has been extremely uncommon in diabetics as compared to patients of occlusive vascular disease (Bradley, *loc. cit.*). Shah (*loc. cit.*) observed that 17 out of 22 patients with CVD had hypertension or associated IHD.

Peripheral vascular disease- The prevalence of peripheral vascular disease (PVD) in Indian diabetics varies from 2·4-13·7 per cent (Mukerjee *et al.*, *loc. cit.*; Ahuja and Tandon, *loc. cit.*; Shah, *loc. cit.*), whereas, it is significantly higher in the Western population. Tulloch (*loc. cit.*) reported this complication in 5·5 per cent of Jamaican diabetics.

Diabetic retinopathy—4·8 to 23·5 per cent of diabetics have been know to have some degree of retinopathy (Waite and Beetham, 1935). Hardin *et al.* (1956) reported it in 8-46·6 per cent, which is approximately the same as reported by various Indian workers (Shah, *loc. cit.*; Ahuja and Tandon, *loc. cit.*; Mathur *et al.*, 1960; Vaishnava *et al.*, 1964; Malik *et al.*, 1970). Puttana (*loc. cit.*) reported a male : female ratio of 32 : 14. Some workers have reported a definite correlation between retinopathy and clinical nephropathy (Pathania and Sachar, *loc. cit.*). It is believed that the duration of diabetes plays a direct role in the causation of retinopathy (Bradley, *loc. cit.*; Mehra and Rajyashree, 1966). At the Joslin Clinic, the control of diabetes during the first 5-10 years of the disease is considered of importance in the prevention of complications of the eye and kidney. Malik *et al.* (*loc. cit.*) reported vascular changes in retinopathy with fluorescine angiography where ophthalmoscopy was normal. Angiography demonstrates microaneurysms, early neovascularisation and retinitis proliferans. They also demonstrated loss of the normal fine reticular pattern of the capillary bed, dilated capillaries and A-V shunts. Proliferative retinopathy has been shown to occur in association with nephropathy, coronary arteriosclerosis specially in persons below 40 years of age and those who have received as no therapy or inadequate therapy (Root *et al.*, 1954).

EFFECTS OF TREATMENT ON CARDIOVASCULAR DISEASE

At the annual meeting of the American Diabetes Association in St. Louis in June, 1970 participants reported 823 patients treated with either placebo, tolbutamide (1·5 g. daily), and insulin. They found higher incidence of cardiovascular complications (12·7 per cent) with tolbutamide as compared to 4·9 per cent with placebo.

Long-term benefits of dietary alterations in preventing vascular disease are yet to be proved, both in the non-diabetic and diabetic patients. Diet control to some extent helps in restoring circulating blood lipids to normal levels. Reversal of hyperlipaemia associated with ingestion of high carbohydrate, low fat diets has been produced by the replacement of saturated with unsaturated fats (Kinsell, 1954; Ahrens, 1957). This may result in reduction of blood cholesterol, total lipids, triglycerides and low density lipoproteins.

Clofibrate produces significant reduction in cholesterol and triglyceride levels, more so helpful in retinopathy (Oliver, 1967).

SUMMARY

In spite of Indian diabetics still suffering commonly from infections including pulmonary tuberculosis and diabetic coma, cardiovascular complications—IHD, hypertension, nephropathy, cerebrovascular disease, retinopathy and peripheral vascular disease—are emerging as leading causes of morbidity and mortality.

The duration of diabetes, obesity, and associated hypertension favour the higher incidence of IHD. Silent myocardial infarction has been observed in 24 to 60 per cent patients. There is some evidence that tolbutamide and phenformin increase the incidence and the mortality due to these complications in diabetics. Such patients are more prone to hypertension, so much so that after the age of 40, 19·4 per cent have this complication as compared to 4·8 per cent below this age. Diabetic nephropathy, both clinical and symptomatic, has been seen in 42 to 97 per cent of all diabetics. There is some

evidence that peripheral vascular disease is not as common in India as in the West. The prevalence of cerebrovascular accidents is not high unless it is complicated by hypertension. The incidence of retinopathy in Indian diabetics is in the same range as reported from other countries. Hypertension, longer duration of diabetes and irregular control of the disease in most of the cases seems to increase the incidence. Serum lipid fractions are increased in the uncontrolled state but even in the well controlled state they remain in the higher range, more so in those who have IHD. Although most of the diabetics will eventually develop one or more of these complications, yet it is believed that proper diet, control of the disease especially in the earlier stages, can at least retard the progress of these complications.

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2

Correlation of Amylase Activity with Ascorbic Acid

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Ascorbic acid in the body influences the activities of quite a good number of enzymes. The metabolism of this biologically important substance is not well understood. Because of the close chemical nature with carbohydrates, ascorbic acid is considered as a derived carbohydrate and is often claimed to be a diabetogenic factor. It is, therefore, quite natural to presume that glycosidase enzyme system influences the metabolism of ascorbic acid in the body. The correlation of ascorbic acid with a number of enzyme systems has been suggested but no study to correlate ascorbic acid with amylase enzyme system is available in the literature.

It is, therefore, aimed in the present study to investigate the probable correlation of ascorbic acid in the amylase enzyme system of the body. The present study is only the initial investigation of the problem.

MATERIAL AND METHOD

83 male healthy volunteers were grouped into two : the first group (group A) consisted of 62 and in the second group (group B) there were 21 male healthy volunteers. In the first group plasma ascorbic acid, serum amylase, urinary amylase, were estimated under the normal and similar type of the diet. In the second group the estimations of serum amylase, urinary amylase and the plasma ascorbic acid were done followed by the administration of 500 mg. of ascorbic acid intravenously and after 30 minutes, the estimations were repeated.

The blood was collected from the antecubital vein in the postabsorptive period and 5 ml. of blood was transferred to a sterile centrifuge tube containing one drop each of 20 per cent potassium oxalate and 5 per cent potassium cyanide for the estimation of plasma ascorbic acid and the remaining 3 ml. of blood was transferred to a sterile, dry centrifuge tube. The plasma and the serum were separated by centrifuging for 10 minutes at 2000-5000 r.p.m. The estimations were completed on the same day as of collection of the samples.

24-hour sample of urine was collected in a bottle containing a few drops of toluene as a preservative.

The plasma ascorbic acid was estimated following the method of Mindlin and Butler (1937), serum amylase was determined by Loon *et al.* (1952) modification of Huggins and Russel (1948) method, and the urinary amylase was measured by the Wohlgemuth method (1908).

RESULTS

The plasma ascorbic acid in the present series of cases of group A was found to vary between 0·48 mg.-0·91 mg. per cent. The frequency of distribution of the plasma ascorbic acid is shown in Fig. 1, and it was evident that the majority of the subjects had the plasma ascorbic acid within the range of 0·60-0·71 mg. per cent and only in 5 cases i.e., 8·06 per cent of the total subjects had plasma ascorbic acid towards the lowest normal value. 3 subjects had the plasma ascorbic acid level about 0·84 mg. per cent.

The serum amylase in these 62 healthy adults was found to vary between 10-20 units. It was noted that 29 cases i.e., 46·7 per cent of the total

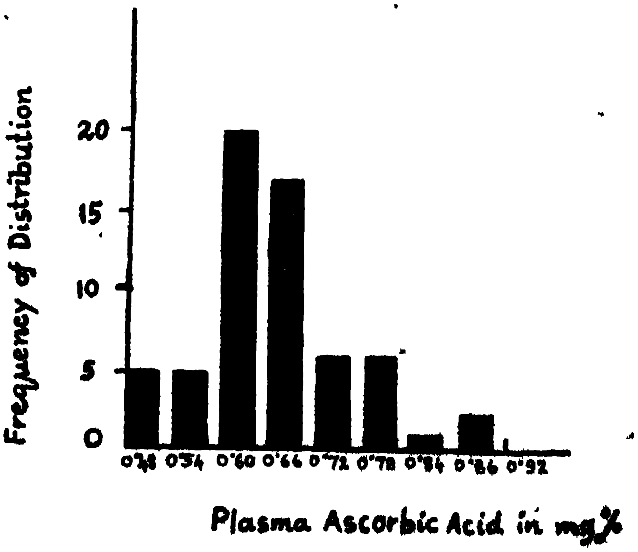

FIG. 1—SHOWING THE FREQUENCY OF DISTRIBUTION OF PLASMA ASCORBIC ACID IN 62 HEALTHY ADULTS

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subjects investigated had the serum amylase activities within the range of 10-12 units, 20 subjects i.e. 32·2 per cent had the activities between 13-15 and only 13 subjects i.e. 20·9 per cent had the serum amylase in the range of 19-21 units (Fig. 2).

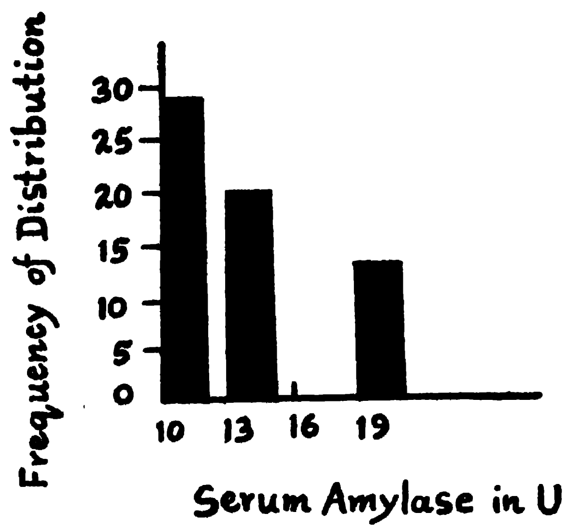

FIG. 2—SHOWING THE FREQUENCY OF DISTRIBUTION OF SERUM AMYLASE ACTIVITIES

The corresponding urinary amylase activities in these 62 healthy subjects were noted to vary between 4 and 20 units. In the majority of the cases the urinary amylase was found to be in the range of 8-11 units, the next highest incidence being in the range of 4-7 units. In 15 subjects i.e., 24·1 per cent of the total cases investigated, the urinary amylase was found to be between 12 and 15 units and only in 2 cases a value ranging between 20 and 23 units was observed (Fig. 3).

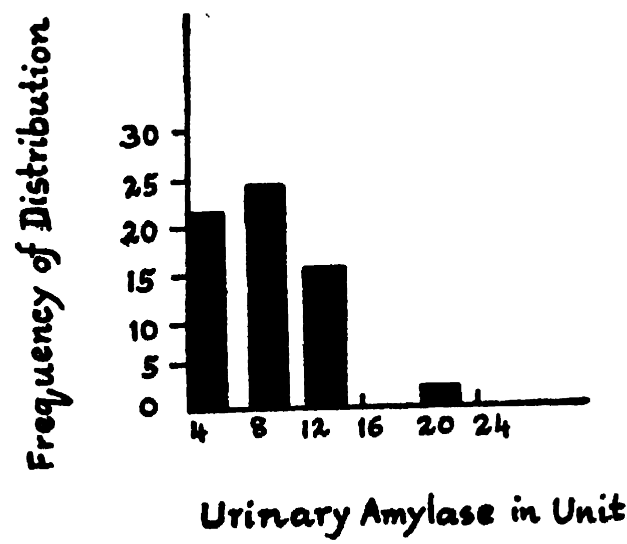

FIG. 3—SHOWING THE FREQUENCY OF DISTRIBUTION OF URINARY AMYLASE IN 62 HEALTHY ADULTS

In group B, 21 healthy subjects were investigated before and after the administration of 500 mg. of ascorbic acid and the results are tabulated in Table 1.

TABLE 1—SHOWING THE PLASMA ASCORBIC ACID, SERUM AMYLASE AND URINARY AMYLASE IN 21 HEALTHY SUBJECTS OF GROUP B BEFORE ADMINISTRATION OF 500 MG. OF ASCORBIC ACID INTRAVENOUSLY

Subject No.	Before ascorbic acid administration			After ascorbic acid administration		
	Plasma ascorbic acid	Serum amylase	Urinary amylase	Plasma ascorbic acid	Serum amylase	Urinary amylase
1	0·50	10	10·0	0·90	15	20·0
2	0·60	10	6·7	1·00	20	10·0
3	0·56	10	14·3	1·40	15	28·6
4	0·64	10	10·0	1·44	12	14·3
5	0·70	10	6·7	1·90	20	28·6
6	0·60	10	6·7	1·50	15	20·0
7	0·60	12	10·0	1·40	20	28·6
8	0·50	15	6·7	1·30	20	20.0
9	0·70	10	6·7	2·00	20	28·6
10	0·65	15	6·7	1·86	20	20.0
11	0·60	10	10·0	1·20	15	20·0
12	0·50	10	10·0	1·20	15	20·0
13	0·50	10	6·7	1·10	12	14·3
14	0·60	15	6·7	1·80	20	20.0
15	0·65	10	6·7	1·70	15	20·0
16	0·60	10	6·7	1·60	20	20.0
17	0·52	15	4·0	1·56	20	10·0
18	0.60	10	10·0	1·60	20	28·6
19	0·50	10	10·0	1·50	15	20·0
20	0·60	10	6·7	1·60	15	14·3
21	0·60	10	6·7	1·80	20	20·0

It was observed that the plasma ascorbic acid level before the administration of ascorbic acid in this group varied between 0·5 and 0·7 mg. per cent and the majority of the cases i.e., 47·6 per cent of the total had the plasma ascorbic acid level within the range of 0·56 mg.-0·61 mg. per cent. In 6 subjects i.e., 28·6 per cent of the total subjects of the group B series, the plasma ascorbic acid level was found to vary between 0·5 and 0·55 mg. per cent and only in 3 and 2 subjects the plasma ascorbic acid level varied between 0·62-0·67 mg. per cent and 0·68-0·73 mg. per cent respectively, whereas, after the administration of ascorbic acid, the range was found to vary between 0·9 and 2·0 mg. per cent.

In a bigger number of cases i.e., 28·6 per cent of the total of the group B, the plasma ascorbic acid level was found to vary between 1·5-1·6 mg. per cent in 4 subjects the level was noted to be between 1·3-1·4 mg. per cent and in 14·3 per cent of the cases, the plasma ascorbic acid was observed to be within the range of 1·1-1·2 mg. per cent, 1·7-1·8 mg. per cent cent and 1·9-2·0 mg. per cent each. The plasma ascorbic acid in the lower range i.e., 0·9-1·0 mg. per cent was noted only in 2 subjects (Fig. 4).

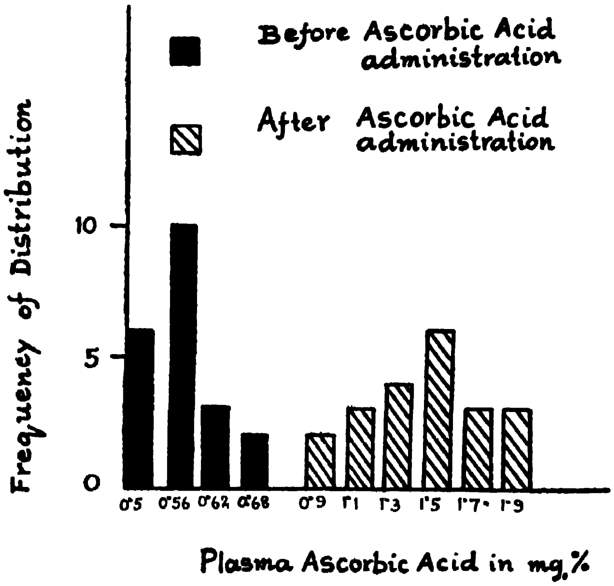

FIG. 4—SHOWING THE FREQUENCY OF DISTRIBUTION OF PLASMA ASCORBIC ACID BEFORE AND AFTER ASCORBIC ACID ADMINISTRATION

The serum amylase activities in this group before the administration of ascorbic acid was noted to vary between 10-15 units and the percentage distribution of the serum amylase activities in these 21 subjects is shown in Table 2 and Fig. 5.

It was evident from the tabulated result that in the majority of the cases i.e., 76·19 per cent of the cases the serum amylase was only 10 units before the administration of ascorbic acid; but after the administration of 500 mg. of ascorbic acid the range of serum amylase was found to vary between 12-20 units and in the majority of cases i.e., 52·38 per cent of the total, the serum amylase was found to be 20 units.

TABLE 2—SHOWING THE PERCENTAGE DISTRIBUTION OF SERUM AMYLASE BEFORE AND AFTER ADMINISTRATION OF 500 MG. OF ASCORBIC ACID INTRAVENOUSLY

Serum amylase (units)	Before administration	After administration
	No. of cases	No. of cases
10	16 (76·19)	Nil
11	Nil	Nil
12	1 (4·76)	2 (9·52)
13	Nil	Nil
14	Nil	Nil
15	4 (19·04)	8 (39·09)
16	Nil	Nil
17	Nil	Nil
18	Nil	Nil
19	Nil	Nil
20	Nil	11 (52·38)
Total	21 (99·99)	21 (99·99)

* Figures in parentheses indicate percentage

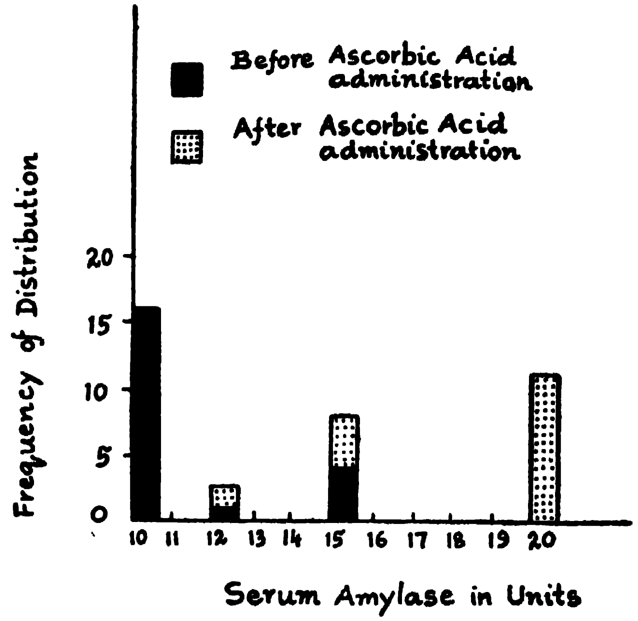

FIG. 5—SHOWING THE FREQUENCY OF DISTRIBUTION OF SERUM AMYLASE ACTIVITIES BEFORE AND AFTER ASCORBIC ACID ADMINISTRATION IN 21 HEALTHY ADULTS

The urinary amylase in these 21 subjects of the group B before administration of ascorbic acid was found to vary between 4 and 14·3 units, majority of the cases i.e., 57·14 per cent had the urinary amylase level of 6·7 units; whereas, after the administration of the ascorbic acid the level was noted to vary between 10·0 and 28·6 units and majority of the cases i.e., 57·14 per cent of the total cases had the urinary amylase of 20 units (Table 3).

TABLE 3—SHOWING THE PERCENTAGE DISTRIBUTION OF URINARY AMYLASE BEFORE AND AFTER ADMINISTRATION OF 500 MG. OF ASCORBIC ACID INTRAVENOUSLY IN HEALTHY ADULTS (GROUP B)

Urinary amylase (units)	Before administration	After administration
	No. of cases	No. of cases
4·0	1 (4·76)	Nil
6·7	12 (57·14)	Nil
10·0	7 (33·13)	2 (9·52)
14·3	1 (4·76)	3 (14·29)
20·0	Nil	12 (57·14)
28·6	Nil	4 (19·04)
Total	21 (99·99)	21 (99·99)

* Figures in parentheses indicate percentage

The mean concentration of plasma ascorbic acid, mean serum amylase and urinary amylase activities of group A and group B before the administration of ascorbic acid is shown in Table 4.

TABLE 4—SHOWING THE MEAN CONCENTRATION OF PLASMA ASCORBIC ACID, SERUM AMYLASE, URINARY AMYLASE OF GROUP A AND GROUP B BEFORE ADMINISTRATION OF 500 MG OF ASCORBIC ACID

	Group A			Group B		
	Ascorbic acid	Serum amylase	Urinary amylase	Ascorbic acid	Serum amylase	Urinary amylase
Mean ...	0·64	13·8	10·2	0·59	11·00	8·00
S.D. ...	0·09	3·86	3·4	0·06	1·69	2·34

Table 5, shows the comparison of the mean values of the plasma ascorbic acid, serum amylase of group B, before and after the administration of 500 mg. of ascorbic acid intravenously.

TABLE 5—SHOWING THE COMPARISON OF THE MEAN VALUES OF THE PLASMA ASCORBIC ACID, SERUM AMYLASE AND URINARY AMYLASE IN 21 HEALTHY ADULTS BEFORE AND AFTER ADMINISTRATION OF 500 MG. OF ASCORBIC ACID INTRAVENOUSLY

	Before administration			After administration		
	Ascorbic acid	Serum amylase	Urinary amylase	Ascorbic acid	Serum amylase	Urinary amylase
Mean ...	0·59	11·00	8·00	1·49	17·30	19·80
S.D. ...	0·06	1·69	2·34	0·28	2·91	5·64

DISCUSSION

The mean serum and urinary amylase values observed in the present investigation are within the normal range observed by the other workers following the same method as in the present investigation. The excretion of urinary amylase is in no way related to the volume or to the specific gravity of the urine. The urinary amylase value of 14·3 units was observed in the healthy individuals whose 24 hours' urine volumes were found to be 600 ml. and also 1700 ml.; on the other hand, the urinary amylase value of 4 units which was the lowest value observed in the present investigation was also obtained in the individual with urinary volume of 1560 ml. per day. Similarly, urinary amylase of 6·7 units was noticed in individuals whose 24 hours' urinary volume were 2020 ml. and 1200 ml. respectively.

The mean plasma ascorbic acid values observed both in group A and group B before the administration of ascorbic acid were without any significant difference and though the mean values were within the normal range, but found to be lower than the value observed earlier in 16 healthy adults of the same age group (Saha and Goswami, 1968).

Though not constant, a close relationship between the plasma ascorbic acid level and serum amylase activity was noted in the subjects of both group A and group B. However, this close relationship was more marked in group B., where after the administration of ascorbic acid there was almost two fold increase in the serum amylase and the urinary amylase with the corresponding rise in the plasma ascorbic acid concentration. With the present data it is not possible to explain the cause of such an increase in the amylase activities after the administration of ascorbic acid but the hypothesis might be suggested. It might be that with the extra ascorbic acid administration, more enzyme is necessary for the metabolism of the vitamin; or the administration of ascorbic acid somehow or otherwise stimulates the factor/factors to release the enzyme to the circulation. This factor or factors might even be the hormones like adrenaline. There is no evidence at present available indicating the necessity of amylase for the metabolism of ascorbic acid; moreover, if it would have been utilised for the metabolic processes of the ascorbic acid, the amount of urinary amylase would not have been increased and hence it is likely that the trigger phenomenon is released by administration of ascorbic acid resulting in higher concentration of amylase both in the plasma and urine. But the data and literature are neither available nor sufficient to prove or disprove any one of these hypotheses and further work is being done in this laboratory.

SUMMARY

Plasma ascorbic acid, serum amylase, urinary amylase, 24 hours' volume and specific gravity of urine were estimated in two groups of healthy adults. In group A, there were 61 and in group B, there were 21 subjects. In group B, the estimation were done before and after the administration of 500 mg, of ascorbic acid intravenously.

The plasma ascorbic acid in 62 subjects of group A was found to vary between 0·48 mg. and

0·91 mg. per cent with the mean value of 0·64±0·09 mg. per cent.

The serum amylase in group A was found to vary between 10-20 units with the mean value of 13·8±3·86 units.

The urinary amylase in group A was noted to vary between 4-20 units with the mean value of 10·2±3·4 units.

In group B, the plasma ascorbic acid before the administration of vitamin C was noted to vary between. 0·50-0·70 mg. per cent with the mean value of 0·59±0·06 mg. per cent and after 500 mg. of ascorbic acid administration, the concentration varied between 0·90-2·00 mg. per cent with a mean value of 1·49±0·28 mg. per cent.

In group B, the serum amylase before treatment with ascorbic varied between 10-15 units with a mean value of 11·00±1·69 units and after the treatment with ascorbic acid the amylase level ranged between 12-20 units with a mean of 17·30±2·91 units.

The urinary amylase in group B, before and after administration of ascorbic acid varied respectively between 4·0-14·3 units and 10·0-28·6 units with mean of 8·00±2·34 and 17·30±2·91 units.

A close relationship between the plasma ascorbic acid level and serum amylase was noticed with an increase of two folds in the concentration of plasma ascorbic acid, serum and urinary amylase activities after the administration of 500 mg. of ascorbic acid intravenously. The probable mechanisms of this increase were suggested by putting forward two hypotheses.

ACKNOWLEDGMENT

The authors are thankful to the student volunteers of Gauhati Medical College for their co-operation and to M/s Glaxo Laboratories Pvt. Ltd., Gauhati for the supply of the ampoules of ascorbic acid (celin).

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3

Comparative Study of the Clinical Effects of Ibuprofen and Indomethacin in Rheumatoid Arthritis

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Ibuprofen is 2 (4-isobutyl phenyl propionic acid) with a molecular weight of 206 and is known to possess anti-inflammatory, analgesic and antipyretic properties in various arthritic conditions. After an oral dose, the drug is absorbed and maximum plasma levels occur in 1½ hours, falling off after 3 hours. The effectiveness of ibuprofen (200 mg. of drug per capsule) was compared with that of a placebo (300 mg. of lactose per capsule) and indomethacin (25 mg. of drug per capsule). All were given orally thrice a day, by a double blind cross over trial.

MATERIAL AND METHOD

35 patients who satisfied the American Rheumatism Association criteria (1959) for the diagnosis of rheumatoid arthritis were studied in detail.

CLINICAL ASSESSMENT :

The following examinations were made before starting therapy and at the end of each treatment period.

Spontaneous pain over the joints—Subjective assessment.

Early morning stiffness—Assessed by noting the time taken to move about freely after getting up from bed.

Mobility of joints—Assessed by noting the degree of passive movements at the individual joints affected without causing pain.

Time taken to walk 10 metres in second :

Joint swelling—The circumference at fixed points around the bigger joints was recorded. As regards finger joints, the change in size was noted by using a set of jewellers rings.

Grip strength—This was recorded by using a sphygmomanometer. The patient was made to squeeze the rubber bulb for 15 seconds and the average of three readings was taken for each hand.

Intermalleolar straddle—This was recorded by noting the maximum separation achieved by the

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examiner between the medial malleoli of the ankles. Mild to moderate pain at the hips was inevitable in this procedure.

Joint tenderness—This was assessed objectively by exerting pressure over the joints using the piston of a metal syringe connected to a mercury manometer and recording the pressure at the mercury column.

INVESTIGATIONS

Complete urinalysis, stool examination for occult blood, ESR at 1 hour, serum asparate and alanine transaminases (SGOT and SGPT), serum alkaline phosphatase, haemoglobin level, total and differential leucocyte counts, blood urea, serum uric acid, fasting blood sugar, latex agglutination test for rheumatoid factor and x-ray of affected joints were done before starting treatment and at the end of each treatment period. All the patients were followed up for six months after the trial to detect any delayed toxicity.

THERAPY

After completing the preliminary investigations to assess the severity of the condition, the patients were allotted at random to a course of treatment. Each course of treatment consisted of 3 bottles marked A, B and C which contained 21 physically similar capsules. Bottles A and C contained capsules of 200 mg. of ibuprofen or 25 mg. of indomethacin (the total weight of all capsules being adjusted at 300 mg. by adding lactose) allotted at random. Bottles B always contained placebo—300 mg. of lactose. The drugs were administered in the serial order of A, B and C, thereby ensuring that there was a period on placebo in between ibuprofen and indomethacin and any carry over effect could thus be eliminated. None of the observers knew about the composition of the capsules during the period of study and the key was made available only after the study was completed.

Out of 35 patients only 28 completed the course. 4 patients did not come for later follow-up. There were 6 males aged between 16-45 years and 22 females aged between 20-65 years.

The clinical data are summarised in Table 1.

History of previous drug therapy was positive in 27 cases. Many of the patients received various drugs in successive course or in combination.

PRE-TREATMENT DATA :

Joint pains—present in 27 cases.
Early morning stiffness—present in 21.
Measurable swelling of joints—present in 25.

TABLE 1—SHOWING JOINTS AFFECTED AND DURATION OF SYMPTOMS

	No. of cases
JOINT AFFECTED	
Multiple (generalised)	15
Small joints of hands and feet only	24
Wrist, elbow or shoulder only	20
Spine only	5
Hips only	2
Knees only	15
Ankles only	12
Temporomandibular only	1
DURATION OF SYMPTOMS	
Less than 6 months (2 weeks to 20 weeks)	8
6 months to 1 year	5
1-2 years	2
Over 2 years	13

Joint tenderness—present in all.
ESR at 1 hour—ranged from 8-150 mm.
SGOT—5-18 I.U (normal range up to 15 I.U.).
SGPT—2·1 to 16·3 I.U. (normal range up to 20 I.U.).
Haemoglobin—8-14·5 g. per cent.
Total leucocyte count—5200-11,000/c.mm.
Blood urea—18-28 mg./100 ml.
Serum uric acid—Normal in 23 cases ; raised (over 5·3 mg.) in 5 cases.
Serum alkaline phosphatase—4·3 to 20 K.A. unit.
Rheumatoid factor detected by latex agglutination test—positive in all.

THERAPEUTIC RESPONSE :

Tables 2 and 3 show the response to therapy during each treatment period.

Long term follow-up of these cases showed no significant difference in the three groups as regards symptomatology, clinical grading or side effects.

STATISTICAL ANALYSIS OF THE RESPONSE :

In this experiment the performance of two drugs —ibuprofen in a dose of 600 mg./day and indomethacin in a dose of 75 mg. per day has been compared. The two drugs together with a placebo were administered to 28 patients in a strictly random manner. The results of 24 patients who completed the trial satisfactorily strictly according to schedule are analysed.

The degree of relief experienced by the patients with regard to the following eight symptoms on administering the drug has been recorded objectively.

TABLE 2—SHOWING RESULTS OF THERAPY

Clinical feature	Ibuprofen			Placebo			Indomethacin		
	Improved	Deteriorated	No change	Improved	Deteriorated	No change	Improved	Deteriorated	No change
Pain	15		13	10	—	18	16	—	12
Early morning stiffness	13	2	13	10	—	18	13	—	15
Mobility	9	--	19	9	---	19	7	—	21
Time taken to walk 10 metres ...	11	--	17	11	3	14	16	—	12
Joint swelling	13	5	10	8	14	6	11	4	13
Grip strength	26	--	2	15	11	2	22	6	—
Inter-malleolar straddle	4	2	22	5	2	21	4	—	24
Joint tenderness	14	1	13	10	1	17	10	—	18
Pressure tolerance	21	1	6	16	4	8	23	1	4
Body weight		no change			no change			increase in 1	
Blood pressure		no change			no change			no change	

TABLE 3—SHOWING OBSERVATION ON LABORATORY INVESTIGATIONS DURING EACH TREATMENT PERIOD

Laboratory finding	Ibuprofen		Placebo		Indomethacin	
	Present	Absent	Present	Absent	Present	Absent
Appearance of albuminuria	nil	28	nil	28	nil	28
Occult blood in stools	nil	28	nil	28	nil	28
Rise in ESR	4	24	7	21	6	22
Rise in SGOT	9	6	7	8	6	9
Rise in SGPT	8	7	8	7	7	8
Rise in serum alkaline phosphatase ...	4	24	6	22	4	24
Fall in haemoglobin	nil	28	nil	28	nil	28
Alteration in total and differential count ...	nil	28	nil	28	nil	28
Rise in blood urea	8	20	12	16	13	15
Rise in serum uric acid	6	22	8	20	8	20
Rise in fasting blood sugar	12	16	11	17	13	15
Change is the latex agglutination test ..	nil	28	nil	28	nil	28

SYMPTOMS :

(1) Pain, (2) early morning stiffness, (3) mobility, (4) time taken to walk 10 metres, (5) joint swelling, (6) grip strength, (7) intermalleolar straddle and (8) joint tenderness.

The response to each drug is assessed as—

(1) Much worse—20 per cent deterioration
(2) Worse—10 per cent deterioration
(3) No change—5 per cent
(4) Improved—5-10 per cent improvement
(5) Much improved—10 per cent improvement
(6) Completely relieved—Symptoms disappearing and numerical scores namely 1 to 6 have been assigned to each category in the above order. The scores have been tabulated and an analysis of variance table has been prepared.

The effects due to the drugs are found to be highly significant at 1 per cent level of significance. Since there is a significant difference between the 3 drugs, the difference between the individual effects of the 3 drugs is tested adopting a 't' test.

Standard error of the difference between means — 0·115

t ; placebo—ibuprofen — $\frac{0{\cdot}490}{0{\cdot}115}$ — 4·3

t ; placebo—indomethacin — $\frac{0{\cdot}485}{0{\cdot}115}$ — 4·2

t ; indomethacin—ibuprofen — $\frac{0{\cdot}005}{0{\cdot}115}$ — 0·04

The difference between placebo and ibuprofen and placebo and indomethacin are highly significant, but the difference between indomethacin and ibuprofen is not found to be significant. Comparing the mean values for ibuprofen and indomethacin it is seen that the mean value for ibuprofen is slightly greater than that of indomethacin. Though therefore it may appear that ibuprofen may be experimentally more effective than indomethacin, this difference did not reach the level of significance.

DISCUSSION

Cardoe (1969) compared the effects of 600 mg. of ibuprofen with that of 300 mg. phenylbutazone given daily in 29 patients. Both the drugs produced significant improvement in grip strength joint tenderness and early morning stiffness. The reduction in ESR was more pronounced in the case of ibuprofen. Thompson *et al.* (1968) reported on the treatment of arthritis with ibuprofen. The drug relieved pain and morning stiffness of rheumatoid arthritis. The same authors found a daily dose of 600 mg. ibuprofen superior to 3 g. paracetamol in a controlled study. Gastro-intestinal symptoms were minimal. Chalmers (1969) found that ibuprofen in a daily dose of 600-900 mg. had an effect comparable to that of 3·6 g. of aspirin. Side effects though few included gastro-intestinal upsets and reactivation of peptic ulcer. Boardman *et al.* (1967) found no significant therapeutic effect in 20 patients with rheumatoid arthritis when given in a daily dose of 600-900 mg. Jasani *et al.* (1968) found the analgesic and anti-inflammatory effects of 750 mg. of ibuprofen similar to those of 5 g. of aspirin ; but inferior to that of 15 mg. of prednisolone. Both prednisolone and ibuprofen led to a fall in ESR and a rise in SGOT and SGPT. In this present trial, the result in 24 cases show that ibuprofen in a dose 200 mg. thrice daily for 7 days was significantly better than that of a placebo and the beneficial effect was similar to that of 75 mg. of indomethacin. Side effects were negligible. The rise in SGOT and SGPT observed in some of the cases in all the 3 groups with all the 3 drugs is probably of no serious consequence since there was no other evidence of hepatic dysfunction, the raised levels returned to pre-treatment values when the drugs were stopped.

SUMMARY

The clinical and laboratory findings in 24 patients with rheumatoid arthritis treated with ibuprofen (600 mg./daily), placebo (300 mg. lactose) and indomethacin (75 mg./daily) were studied in a comparative trial of these drugs. Ibuprofen and indomethacin in the doses given had similar beneficial effects. No serious side effects were observed.

ACKNOWLEDGMENT

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4

A Study of Amoebic Liver Abscess

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Amoebic abscess of liver appears in only about 10 per cent of cases of amoebic colitis (Wilmot, 1962). It is reported that carrier state for *Entamoeba histolytica* cyst in the faeces is an important source of liver abscess. Chuttani *et al.* (1961) in survey of medical students found 48 students harbouring *Ent. histolytica,* of which 33 (55·3 per cent) were symptomless. Mazzitelli (1959) and Lupasco *et al.* (1964) reported an appreciable number of symptomless cyst passers. Chuttani *et al.* (1968) screened 3982 subjects from hospital patients and detected *Ent. histolytica* cyst in the stools of 284, of them 193 (67·9 per cent) were symptomless carriers. Despite a prevalent asymptomatic amoebiasis it is not known why only a few develop liver abscess. Many factors like virulence of infection, resistance of the host, diabetes mellitus, alcoholism and malnutrition may play an important role in determining the hepatic involvement.

MATERIAL AND METHOD

Eighty cases with proved amoebic liver abscess were included in this study. Aspiration of the abscess was carried out in 59 cases.

The diagnosis of amoebic liver abscess was established by the presence of one or more of the following factors:

(1) Aspiration of anchovy sauce colour pus which was sterile on bacterial culture.

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(2) Filling defect on liver scan which reverted to normal after specific anti-amoebic treatment.

(3) Hepatomegaly with palpable abscess which responded to specific anti-amoebic treatment.

LABORATORY STUDIES:

Serum bilirubin was estimated by the method of King and Wooton (1956). Total serum protein and albumin was determined by Biuret method (King and Wooton, *loc. cit.*). SGOT and SGPT estimations were carried out according to the method of Reitman and Frankel (1957) and alkaline phosphatase was estimated by the method of King and King (1954).

Indirect haemagglutination test (micro haemagglutination test) was performed with axenic antigen and macro haemagglutination with the AIIMS antigen (Prakash *et al.*, 1969).

OBSERVATIONS

Age and sex incidence—There were 63 males and 17 females. The maximum incidence of the disease was between the age of 21 and 30 years in males and 41 and 50 years in females.

The sex distribution and age group is shown in Table 1.

TABLE 1—SHOWING AGE AND SEX INCIDENCE IN 80 CASES OF AMOEBIC LIVER ABSCESS

Age (years)	No. of patients	Male	Female
11—20	7	5	2
21—30	29	25	4
31—40	19	16	3
41—50	16	11	5
51—60	7	6	1
61—70	1	—	1
71—80	1	—	1
Total	80	63	17

Clinical features—The onset was acute with high fever and pain in the right hypochondrium in two cases. In 27 cases the onset was with mild fever ranging between 99°F and 101°F associated with vague upper abdominal pain. In the remaining 51 cases, the onset was gradual with vague dull pain in the right hypochondrium with occasional mild fever.

The average duration of illness before reporting to the hospital was 4·2 weeks with a range of 1 to 40 weeks. History of dysentery within last 3 years was obtained from 20 patients. General nutritional status was good in 26 cases and poor in 54 cases. Mild to moderate temperature was present in 69 cases. In 11 cases the temperature was normal. Jaundice of mild to moderate degree was present in 7 cases.

Liver was enlarged in 78 cases. Fifty-seven cases had liver buldge with interocostal tenderness. Right lobe was enlarged in 63 and left in 3 and diffuse enlargement of liver was present in 12 cases. Average size of liver enlargement was 5·9 cm. with a range of 1 to 12 cm. In three cases the liver was firm in consistency.

Major clinical features of the patients are shown in Table 2.

TABLE 2—SHOWING CLINICAL FEATURES

Clinical feature	Number of cases	Percentage
Onset:		
Sudden	29	36·3
Gradual	51	63·7
Dysentery during past 3 years	20	25·0
Pain:		
Upper abdomen	27	33·7
Right hypochondrium	53	66·3
Nutritional status:		
Good	26	32·5
Poor	54	67·5
Fever:		
Mild to moderate	69	86·3
No fever	11	13·7
Jaundice	7	9·0
Liver:		
Buldge	57	71·2
Right lobe enlargement	63	78·8
Left lobe enlargement	3	3·7
Diffuse enlargement	12	15·0
Intercostal tenderness	57	71·2

Results of investigations—Total leucocyte count was below 5,000/c.mm. in 2, up to 10,000 in 65 and above 10,000/c.mm. in 13 cases. Haemoglobin was below 10 g. per cent in 24 cases and above 10 g. per cent in the remaining 56 cases. ESR was raised in 26 cases.

Stool examination showed *Ent. histolytica* cysts only in 9 cases.

Urine examination showed bile pigment in 5 and increased urobilinogen in 4 cases.

Liver function tests: Serum bilirubin was above

TABLE 3—SHOWING SERUM BILIRUBIN LEVELS IN 80 CASES OF AMOEBIC LIVER ABSCESS

Serum bilirubin in mg. %	No. of cases with percentage
Less than 1	64 (80%)
1·0—2	11 (13·75%)
Up to 4	1 (1·25%)
Up to 6	1 (1·25%)
Up to 8	2 (2·50%)
Up to 10	1 (1·25%)

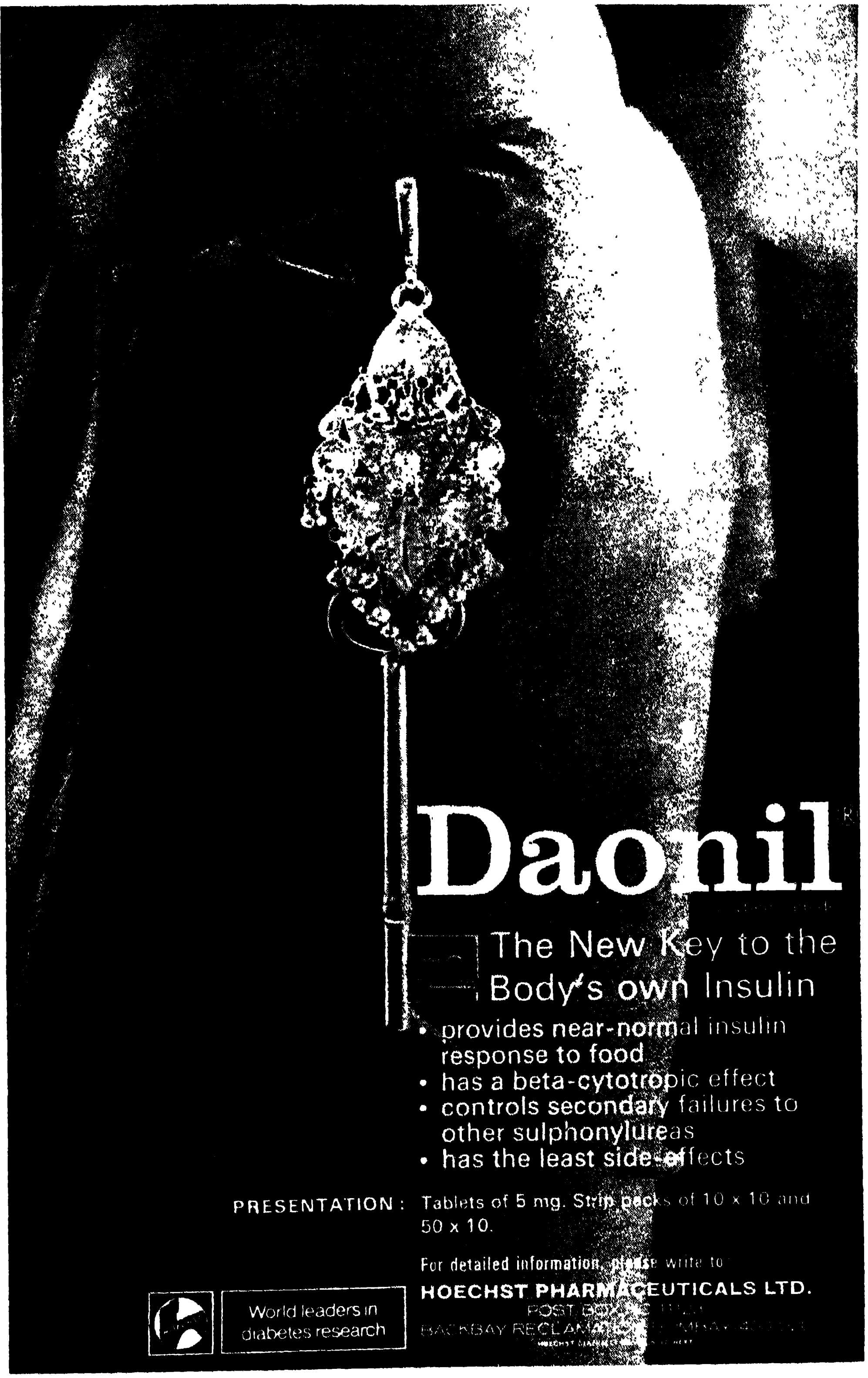

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TABLE 4—SHOWING LIVER FUNCTION TESTS IN 80 CASES OF AMOEBIC LIVER ABSCESS

	Total protein (g. %)	Serum bilirubin (mg. %)	Serum albumin (g. %)	Globulin (g. %)	Alkaline phosphatase (KA Units)	Cholesterol (mg. %)	SGOT (millimol/ml./hour/40°C	SGPT
Range ...	0·3-10	5·7·8	1·7-3·8	2·2-4·7	8-44	90-270	0·6-4·3	0·5-5·7
Average ...	1·4	6·3	3·0	3·4	22	160	2·14	2·12

2 mg. per cent in 5 cases. Range of serum bilirubin is shown in Table 3. Mean serum protein value was 6·3 g. per cent, albumin 3 g. per cent and globulin 3·4 g. per cent. Globulin was increased in 33 cases (above 3·5 g. per cent). Alkaline phosphatase was raised in 56 cases; the mean value being 22 KA units. There was very modest rise of transaminases. SGOT was elevated (above 1·7 millimols/ml./hour/40°C) in 33 cases and SGPT in 29 cases. Serum cholesterol values were less than 150 mg. per cent in 18 cases. Liver function tests are shown in Table 4.

Blood urea was raised in 12 cases.

Pleural effusion was present in 14 cases and dome of the diaphragm was elevated in 49 cases. Pleural reaction was observed in 4 cases.

DISCUSSION

The present study of 80 cases of amoebic liver abscess confirms the earlier report of high prevalence of the disease in India (Reddy and Subramanyam, 1962; Tandon and Rajan, 1966, 1967; Chuttani *et al.*, 1968). It may be stressed that this is despite an intensive and often indiscriminate use of amoebicidal agents in medical practice to treat the colonic amoebiasis. Male to female ratio noticed in the present study was 3·7:1 with maximum incidence of the disease in third decade for males and fifth decade for females. Kini and Mammi (1970) reported male to female ratio of 12:1 which they attributed to low intestinal amoebiasis in female is not borne out by our results. Previous history of dysentery was available in 25 per cent of our cases which compares well with the observations of Sivasankaran *et al.* (1966). The onset was sudden with fever and pain in right hypochondrium in 36 per cent and gradual in onset in 64 per cent of cases. Most interesting feature was the presence of clinical jaundice in 9 per cent with serum bilirubin level above 1 mg. per cent in 20 per cent and above 2 mg. per cent in 7 per cent of cases. Serum bilirubin was between 6-10 mg. per cent in 5 per cent cases. Lamont and Pooler (1958) reported serum bilirubin levels above 0.8 mg. per cent in 10 per cent cases. Salako (1967) found high level in 9·6 per cent cases. Kini and Mammi (*loc. cit.*) noted high incidence of jaundice in 17 per cent cases. Highest incidence of jaundice in amoebic liver abscess (30 per cent) has recently been reported by Datta *et al.* (1971). The jaundice has been considered due to pressure on bile ducts. Recent studies of BSP metabolism in amoebic liver abscess (Datta *et al., loc. cit.*) suggests that jaundice may be due to defect in the transport mechanism of the bilirubin in the liver.

Most of the liver function tests are of no diagnostic value. However, an elevation of alkaline phosphatase in 70 per cent in the present series suggests the diagnostic value of this investigation. This confirms earlier similar suggestions by Viranuvatti *et al.* (1963), Tandon *et al.* (1966), and Salako (*loc. cit.*). The diagnostic value of haemagglutination test has been established by extensive study of Prakash *et al.* (*loc. cit.*). These investigators have demonstrated the superiority of haemagglutination test over reports of other serological tests.

Amoebic abscess of the liver was diagnosted on scanning in 49 of the 62 patients which provided filling defect of "Broad net pattern" (Tandon and Rajan, 1966). Although the filling defect on the liver scan is non-specific finding, the diagnosis of abscess can be very much strengthened by this investigation in a clinically suspected case.

Aspiration of the abscess was done in 63 per cent cases, 38 per cent had aspiration done twice. One patient had 5 aspirations of the abscess.

Rupture of the abscess into the surrounding structures is a serious complication (Alkan *et al.*, 1961). Intraperitoneal rupture occurred in 4 per cent and proved fatal in 1 case. Rupture into lungs and pleura was observed in 14 per cent cases out of which 5 per cent (4 cases) ended fatally.

Total mortality was 6·3 per cent. All were females. Two cases were in 4th decade and 2 in 5th decade and one in 6th decade. Blood urea was above 40 mg. per cent in all fatal cases. No other contributory factors could be ascertained.

Result of the medical treatment was good. Residual enlargement of liver up to 1-5 cm. was still present in 70 per cent cases at the time of discharge,

Summary

The clinical features, and laboratory data in 80 cases of amoebic liver abscess is presented. Male to female ratio was 3·7 : 1. Except general features of poor nutritional status noticed in 67·5 per cent, no other contributory factor like diabetes mellitus or alcoholism was noted in any of the cases. Interesting clinical observations were afebrile clinical presentation in 13·7 per cent, jaundice in 9 per cent and firm hepatomegaly consistent with malignancy in 4 per cent cases. Serum alkaline phosphatase elevation was noted as the most significant abnormality in the liver function test. Diagnostic value of liver scan and haemagglutination test is confirmed. Serious complications included rupture of the abscess into the pleural cavity or lung in 14 per cent of cases and rupture into peritoneal cavity in 4 per cent of cases. Mortality was 6·3 per cent. It needs stress that mean duration after the onset of symptoms before reporting to hospital was 4·2 weeks. In general, the response to specific anti-amoebic therapy was good with resolution of abscess but mild hepatomegaly persisted in a majority of cases after completion of treatment.

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5

Parcentesis in the Management of Acute Abdomen

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Acute abdomen forms bulk of the emergencies of a general surgeon, often taxing the diagnostic acumen regardless of the experience of the surgeon. Any aid in the avoidance of the diagnostic pitfall is thus welcome. Solomon (quoted by Prout, 1968) first described the technique of abdominal paracentesis more than 60 years ago. Neuhof and Cohen (1926) carried out the first comprehensive study of abdominal paracentesis and described its usefulness in abdominal injuries, acute pancreatitis and peritonitis. The technique, however, did not gain general acceptance because of the fear of injuring abdominal viscera. Numerous studies have been reported of recently, which speak of the usefulness of this procedure. The authors were stimulated to this study when paracentesis was first carried out in a young man aged 22 years who came with history of acute abdominal pain of 2 days' duration and a mass formation in the right iliac fossa. He was treated on expectant lines when it was noticed that the area of dullness on percussion had increased and paracentesis revealed haemorrhagic foul smelling fluid suggestive of gangrenous gut. On laparotomy volvulus of the small gut with gangrenous changes was found, resection of which was followed by recovery of the patient. Since then 40 paracenteses have been performed in 39 cases for varying conditions.

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TECHNIQUE:

A 5 ml. glass syringe fitted with No. 20 Gauge intravenous needle is used to puncture the parietal peritoneum in four abdominal quadrants, in the flanks and selected area of dullness after local anaesthesia. The quadrant is selected according to the site of pathology. In 90 per cent cases positive result was obtained in the right lower quadrant alone. The other quadrants are punctured only in case of a negative result.

The result is indicated as positive when abnormal fluid is aspirated, whatever small in amount, and negative if no or less than 0.5 ml. of clear serous fluid is aspirated. Naked eye examination alone of the nature of the fluid (clear, turbid, purulent, bloody, serosanguineous, bile stained, frank clear bile, gaseous, faeculent or contains food particles) is relied upon to arrive at a conclusion. Amylase estimation was done only in 2 cases, suspected of acute pancreatitis.

DISCUSSION

Perforated viscus—24 out of 39 cases where paracentesis was performed, comprised perforated viscus. Of the 24 paracenteses, 18 paracenteses revealed frank pus and these were diagnosed as peritonitis due to burst appendix. Relatively fit patients were opened by a mid-line incision for abdominal toilet and bad risks were just drained under local anaesthesia. The diagnosis was incorrect in only 2 instances where duodenal ulcer perforations were found, though clinically or radiologically there was no clue to the diagnosis preoperatively. Paracenteses were negative in 2 cases and the patients recovered on expectant treatment, being regarded as forms of peritonitis of less severity. Paracentesis fluid revealed frank bile in 2 cases and were correctly related to gall-bladder perforations at operation. Before paracentesis, diagnosis was quite uncertain and gall bladder disease was not thought of. One paracentesis revealed bile stained pus, the patient was in his 2nd week of febrile illness and correctly revealed terminal ileum perforation due to typhoid fever. One paracentesis was false negative, since no fluid was aspirated but because of increasing rigidity laparotomy was done, and this again turned out as typhoid ulcer perforation in the terminal ileum. At operation pus was found in the pelvis and in loculated form between loops of gut disposed mostly centrally and had thus evaded the needle. Perforated viscus gave a high positive rate of 95 per cent, giving a coherent clue to the diagnosis and a great help in their management. Similar high positive rate in perforations have been given by Baker *et al.* (1966). On the other hand negative paracentesis does not exclude a serious catastrophe as in the case of typhoid ulcer perforation illustrated. Baker *et al.* (*loc. cit.*) and Prout (1968) stressed that negative paracentesis has no value.

Acute pancreatitis—2 cases suspected of acute pancreatitis yielded sero-sanguineous fluid with amylase level of 500 and 1000 Somogyi units. Corresponding serum level was 400 units in one and was not done in the other. Both cases responded to expectant treatment. Keith *et al.* (1950) found high amylase levels in paracentesis fluid and it had remained higher for 2 to 3 days more than the serum level. However, serum amylase levels may only be slightly raised (Howard, 1949) and high levels in paracentesis fluid may also be met with in perforated ulcer (Amerson *et al.*, 1958).

Traumatic cases—Paracentesis done in 3 cases of blunt injury abdomen revealed frank blood and in addition food particles in one. There was injury to the spleen, the liver and the gut respectively. One case of penetrating injury of the chest on the left side above the level of the nipple was being managed expectantly when he developed increasing rigidity and tenderness in the left upper abdomen. Paracentesis showed frank blood and at operation the spleen was found to be involved by the stab.

Williams and Zollinger (1959) had empoyed paracentesis extensively in the management of traumatic cases. Usefulness has been appreciated by Prout (*loc. cit.*) and traumatic cases comprised the majority in the study of paracentesis by Gjessing *et al.* (1972) finding it useful in their management.

Strangulation obstruction—3 cases of acute abdomen of obscure nature revealed foul smelling frank haemorrhagic fluid and the diagnosis of strangulation obstruction was made. In one there was volvulus of the small gut and that of the caecum in the other with gangrenous changes. Both survived the operation. In the third, mesenteric infarction was detected at operation with widespread gangrene of the small gut and was lost. The authors feel highly gratified and regard paracentesis as solely responsible in initiating the diagnosis. Their first case of paracentesis had stimulated the authors, to pursue the study.

Postoperative cases—There were 3 cases of this group. In 2 cases, stormy postoperative period ensued gall bladder procedures and paracentesis showed bile and pus and these collections were then drained. The third patient had been earlier operated for typhoid ulcer perforation, developed huge distension of the abdomen with respiratory difficulty and was toxic. Paracentesis revealed gas under tension which was let out and later purulent material could be removed. The patient was drained through a stab incision under local anaesthesia and made an unexpected recovery. It is assumed, there was a leakage from the sutured site.

Simple mechanical obstruction—Paracentesis was not intended in these cases but was done because of the obscurity of the diagnosis. In all the 3 cases, penetration of the gut occurred, since paracentesis revealed liquid faeculent odourous material. No complication ensued. One recovered on expectant therapy. In 2 laparotomy was performed for the mechanical obstruction but did not reveal any leakage or even puncture sites.

Similar instances where penetration of the gut had occurred on paracentesis without any complication have been reported by Williams and Zollinger (*loc. cit.*); Giacobine and Siler (1960); Baker *et al.* (*loc. cit.*) and Prout (*loc. cit.*) This is attributed to the self-sealing action of the gut wall.

SUMMARY AND CONCLUSION

The role of paracentesis in the diagnosis and management of acute abdominal conditions has been studied. 40 paracenteses were done in 39 cases.

There was 95 per cent positive results in cases of perforated viscus.

Paracentesis of frank bile led to the diagnosis of leakage from the biliary tract not diagnosed clinically or radiologically.

It has aided in the management of acute pancreatitis, traumatic cases and postoperative cases.

Paracentesis initated the diagnosis of internal strangulation obstruction out of uncertainty.

Paracentesis is a safe simple and rewarding procedure and so a plea is made for its increased acceptance in clinical practice.

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PRACTITIONERS' SERIES

Factors Influencing Prognosis in Carcinoma of Breast

K. M. CHITANIA*

A vast amount of literature has emanated regarding the multitudes of factors discussing the carcinoma of breast in recent years.

The cancer of the breast usually kills its victim not by its local spread but by the general dissemination. The main problem lies not only in the clinical form of the disease but also in the precancerous subclinical form, its susceptibility to certain factors in such a state, its evolution in course of time and the guidelines adopted in its management. Thus the prognosis of carcinoma of breast can be improved by fuller undertaking of the various factors influencing the course of the disease in clinical and subclinical stage. These in general are : age, pathology, pregnancy and parity, heredity, clinical presentation, steroidal metabolic studies, immunity factor, treatments adopted and other ill understood factors.

AGE

Although carcinoma of breast commonly occurs in women past middle age, the disease is governed by the sexual status rather than age. Menopausal women have a better survival rate than the premenopausal ones. Castrated or ovarian irradiated patients have half the incidence of carcinoma of breast developing in them as compared to the normal ones, and the survival rate is also better. The prognosis with hormone therapy is also better in postmenopausal women.

The two great stages in the sexual life of a female also weigh heavily in the development of the disease, i.e., menarche and menopause. Restrospective studies have suggested that the different factors influencing the sexual life of the female at these stages contribute to the development of two different growth rates of future carcinoma of breast. These different growths disseminate from their primary inception as different types of malignancies and can kill their victims.

PATHOLOGY

This factor plays a major role in the prognosis, although it is still not fully understood. Even though one encounters adenocarcinoma of the breast as the commonest form of carcinoma, the inherent aggressiveness of the tumour, vascularity

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of the breast and the immunological response of the host determine the final outcome of the disease pathologically, e.g., schirrous, atrophic schirrous, encephaloid or inflammatory type, etc.

A study of the growth rate and the size of the primary when first encountered gives an idea of the pathogenesis of the disease, i.e., as to when dissemination occurred. Clinical and pathological studies of these factors reveal two different patterns of growth rates or one with changing pattern of growth rate. These growth rates or the "lines of development, or fits and starts", of the primary and the metastatic growth of the disease are dependent upon the least differentiated cells which metastasise. Thus the secondary deposits grow not only at a fast rate but also at a quite early stage of the disease. This development remains quiscent and in a state of controlled carcinomatosis. What includes this controlled state into a state of uncontrolled form is still unknown. Irradiation in some form can affect state.

Histologically this is evinced by sudden alteration of the morphological pathway of the differentiated cell, leading to a slow growing tumour into a fast one, although experimental evidence refutes such claims.

Lactational carcinoma of the breast have the worst prognosis, while the atrophic schirrous form has the best one, probably because of the vascularity and the functional activity of the acini of the breast.

PREGNANCY AND PARITY

Cancer of the breast when occurs concurrently with pregnancy has a better prognosis, especially if it occurs in the third trimester. Similarly it is better when carcinoma occurs in the first half of pregnancy as compared to the matched controls of the premenopausal patients. Survival rates of 75 per cent have been noted in patients with breast carcinoma whose pregnancy followed mastectomy.

As regards pariety, the prognosis is more favourable in cases who were multiparous. The incidence of cancer of the breast also is less as compared to the nulliparous ones. This has a direct bearing on the normal physiological activity of the breast.

HEREDITY

Inheritence of the susceptibility of carcinoma of breast is postulated on experimental animals and also on the strong predisposition of the disease in certain families.

CLINICAL PRESENTATION

The disease and the metastatic spread by the blood stream have commenced many years previous to the clinical appearance of the disease. The disease progresses relentlessly even though different combinations of therapy are instituted as the pretherapeutic seedlings in their metastatic sites continue to enlarge.

The standard T N M classification adopted by the International Union against Cancer in 1960 is based on clinical judgment, as no correlation with the exact pathological state of the disease, as the spread has already started long before the clinical menifestation of the disease. This is evident from the fact that the internal mammary lymph nodes are involved in 28 per cent of all clinical cases, and that 37 per cent of all cases having the primary in the medial half of the breast. The clinical aberration regarding the detection of even the axillary and supraclavicular group of glands by different clinicians makes the standardisation of the T N M classification untenable. In the subclinical form or the controlled carcinomatosis, there is a state of prolonged quiscence rather than a short regression.

Regarding the secondary deposits, the axillary nodes once metastasised diminish the survival rate by half. The blood borne metastases are not so important for survival as compared to the nodal involvement, as there is controlled carcinomatosis with subclinical dissemination of cancer of cells induced by immune reaction transferred by lymphocytes to thymus, spleen, etc., forming antibodies. This explains a 15-year survival rate more in Stage II as compared to a Stage I of the T N M classification. Similar is the case with the medullary form of the disease. In advanced carcinoma of the breast with metastasis in glands or distant places there is no place for a standard approach to the problem.

STEROIDAL METABOLIC STUDIES

Steroids have an important bearing on diagnosis, prognosis and completeness of operative treatment or chemotherapy in carcinoma of breast. It has been found that women fall into two groups, depending upon the metabolite excretion in their urine of androgenic and oestrogenic hormones. Patients with low levels of the androgenic metabolite (aetiocholanalone) fare badly as compred to these with low levels of 17 OH corticosteroids, i.e., they are negative discriminants, and so chances of developing carcinoma are higher in later life. A subclinical population of breast cancer likely to develop the disease could be found out, and then to alter their hormonal environment at that early stage, and so improve the prognosis.

The steroidal abnormality might have preceded the clinical appearance of carcinoma of breast and might have caused it. These abnormalities are multidirectional. In postmenopausal women oestrogen stimulated vaginal smears, high excretion of oestradiol and obesity and hypertension help in detecting the subpopulation of cancer of the breast.

The induced endocrinal imbalance has substantiated androgenic therapy in susceptible individuals. The clinical response of this therapy is related to the urinary androgenic levels. The majority of the clinicians take the view of cautious optimism in pursuance of this experimental but a potentially far reaching field.

IMMUNITY FACTOR

The developmental stages of the tumour from its inception, passing into subclinical controlled carcinomatosis into the clinical stages and its subsequent growth into the uncontrolled carcinomatosis, present a host-tissue reaction of an immunological type. The blood borne dissemination in the subclinical stage induce an immunity reaction of antigen-antibody type, being transferred by lymphocytes to thymus, spleen, etc. These antibodies prevent both primary and secondaries from growing uncontrollably. This controlled carcinomatosis becomes uncontrolled when the immunity breaks down. Although irradiation is supposed to effect such a change, the exact cause is still unknown. The immunity factor also explains the response to various treatments to the disease. Thus it explains the response of node positive and node negative cases treated with radiotherapy. The help by radiotherapy in patients over 65 years is also explained, as the immunity reaction fades with increasing age. The sudden development of metastatic deposit many years after the treatments is also so explained. Similarly the spread to the regional and distant lymph nodes, and not the local seedlings is due to the immune reaction. The multicentric origin and also chances of development of bilateral tumours are due to the susceptibility of host tissue to the same environment. Once the immunity breaks, the treatment by one or the other methods makes no difference in the course of the disease and the final outcome.

Partial loss of immunity will be exacerbated by radiation as part of the initial treatment, and results in an increased metastasis and falls in the survival rate. This factor goes strongly against the institution of radiotherapy in postoperated cases with negative nodes. Spontaneous regression of certain cases of carcinoma of breast, though ill understood could be very well be explained by immunological status of the individual. The disquieting situation of identical outcome by policy of noninterference to supraradical mastectomy with or without pre-or postoperative radiotherapy, is thus the direct outcome of this immunological status of the individual. The same also explains the fact that 15 years survival rate is more in Stage II than Stage I. In case of medullary carcinoma the host resistance is manifested by lymphocytic infiltration of the tumour histology.

The aim thus should be to control the disease and maintenance enhancement of host resistance. Attempts at increasing the host resistance have been so far unsuccessful. Administration of B.C.G. vaccines and other stimulants for increasing the antibody titre have not been fruitful. As no known antigen specific of tumour cell have been isolated, the immunological approach, though valid, is still very experimental.

TREATMENTS ADOPTED

Ever since the inception of Halstead's radical mastectomy so as to remove the diseased breast and draining lymphatics and the lymph nodes, a flood of different ideas have been put forward in the management of carcinoma of the breast. Workers in this field vary in their belief from 'leave it alone' to ultraradical mastectomies with or without radiotherapy and chemotherapy. Only recently, with the emergence of a more rational approach to the problem, a guide line has been appreciated.

One of the fundamental argument raised from this situation is whether the disease of carcinoma of breast is curable or not. The five-year survival rate, as applied to most of the diseases of similar nature, is not applicable here. One has to reach a sad conclusion that the disease is in fact an incurable one, and that the disease disseminates long before a curative attempt is undertaken. Instead of a cure of the disease, one should consider survival plus recurrence free period as the criterion in the management of this dreadful disease.

As surgery or radiotherapy has made no difference in the course of the disease, a simple form of surgery is advised to remove the local disease.

Any attempt at radical surgery in cases of Stage III or IV is useless if not harmful. Only hormone therapy, endocrinal ablative surgery or chemotherapy have some place for palliation. The concept of endocrinal therapy is based on the metabolic studies and the hormone dependence of half the number of tumours of the breast In general the response to hormone therapy is greater the more remote a woman is postmenopausally.

ILL UNDERSTOOD FACTORS

Slow growing tumours have better prognosis than fast growing ones. Cytotoxic and palliative radiotherapy although do not materially affect the outcome of the disease, in few cases have regressed the tumour growth remarkably, looking like apparent cures.

SUMMARY

Presymptomatic treatment and diagnosis have not made much material change in the outcome of the disease. The duration of illness in a particular Stage or Grade has not altered by conventional line of treatment. Immunological approach is still in experimental stage, although some hope is raised from that direction. Host-tissue symbiosis disease has not yet reached sufficient strides to reject a radical approach in carcinoma therapy. Proper genetic mating to diminish the carcinoma susceptibility has not reached beyond experimental stage. Excessive surgery or radiotherapy do not help to improve the survival rates, on the contrary they increase the morbidity. Modifying hormonal or immunological status of an individual by various therapies available at the moment are perhaps the best hopes for preventing and ameliorating the disease in the subclinical stage.

CASE NOTES

I

Hyperosmolar Non-Ketotic Diabetic Coma

V. P. BEDI*, M. KOCHHAR**

Since the publication of the paper by Sament and Schwartz (1957) there has been a spate of publications of case reports (Lucas *et al.*, 1963; Danowski and Nebarro, 1965; DiBendetto *et al.*, 1965; Halmos *et al.*, 1966; Martin, 1968; Kumar, 1968; Hayes and Woods, 1968; Macaulay, 1971; Collins and Harris, 1971), reviews (Danowski and Nebarro, *loc. cit.*; DiBendetto *et al.*, *loc. cit.*; Schwartz and Apfelbaum, 1965; Solvsteen *et al.*, 1968; McCurdy, 1970; Danowski, 1971) and underlying pathophysiological mechanisms (Jackson and Forman, 1966; Johnson *et al.*, 1969; Oakes *et al.*, 1969; Vinik *et al.*, 1970; Jackson, 1971; Arief and Caroll, 1971; Gierch *et al.*, 1970 and 1971). A fair degree of unanimity has developed as regards the management of such cases over the years (Johnson *et al.*, *loc. cit.*; Solvsteen *et al.*, *loc. cit.*; Jackson and Forman, *loc. cit.*; Gierch *et al.*, *loc. cit.*). The mortality is high (40 per cent to 50 per cent) but is likely to improve with greater awareness of the condition and early and prompt treatment of such cases.

Similar cases have been known and described in the surgical literature (Rosenburg *et al.*, 1965; Boyer, 1967; Oakes *et al.*, *loc. cit.*) occurring mostly after burns. Recently, Ashworth *et al.* (1968) and Oakes *et al* (*loc. cit.*) have described the importance of this condition in surgical patients.

Below is described a patient who slipped into hyperosmolar non-ketotic coma without regaining consciousness after a major surgical procedure. We could find no mention in the literature where a surgical procedure has been incriminated as a precipitating factor.

CASE REPORT

Mrs. V. W., 37 years, gravida 8th, was admitted on 30-11-1971 at 8 A.M. for the first time in our hospital. She was under the antenatal care of some other institution. Records with the patient showed that she developed glycosuria during 3-4th month of the current pregnancy which disappeared later. Glycosuria was not investigated any further. The patient had a history of previous big babies and the last child was a stillbirth four years back.

At full term she was admitted in the other institution but she got herself discharged from there after two days and was admitted in a private nursing home. Here she stayed for another two days and was given oxytocin in 5 per cent glucose to induce labour. She was referred to our hospital for post-maturity and big baby and was admitted on 30-11-1971.

On examination the patient was found to be obese and the uterus was enlarged to account for full term pregnancy. The head was presenting and not engaged. Foetal heart sounds were good. The baby seemed to be big. Pelvic examination showed the cervix to be 2/5th dilated and no obvious cephalopelvic disproportion. Her blood pressure was normal and haemoglobin was 10 g. per 100 ml. of blood.

Management—Oxytocin in 5 per cent glucose was started. Foetal heart sounds became irregular. A lower segment caesarian section was done at 12-45 P.M. for foetal distress (using 0·25 g. of pentothal and gas and oxygen) and a live female child weighing 3 kg. and 350 g. was delivered. The operation itself was fairly simple and completed within 45 minutes and without any untoward incident during the operation. Her pre-operative urine examination was missed.

The patient failed to gain consciousness till 3·00 P.M. Examination at this stage showed her pulse rate to be 100 per minute and regular, blood pressure 120/70 mm. Hg, breathing shallow and the patient deeply comatosed with sluggish corneal reflex and absent tendon jerks. No other neurological abnormality could be detected. Other causes such as cerebrovascular accidents, overdosage with the drugs, jaundice and hypersensitivity to the drugs were thought of and excluded. A urinary catheter passed at this stage brought out 1000 ml. of pale yellow urine. The urine gave a brick-red reduction with Benedict's solution and was negative for ketone bodies. Blood sugar was 460 mg. per 100 ml. of blood at this stage. We gave 120 units of soluble insulin intravenously and 140 units of soluble insulin intramuscularly with about 4 litres of fluids consisting of normal saline 1000 ml., glucose saline 1000 ml. and glucose 5 per cent, 2000 ml. in the first 6 hours. The patient started regaining consciousness after about 10 hours of stopping general anaesthesia and became delirious and restless in the recovery period. She regained

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full consciousness 24 hours after stopping the general anaesthesia. No more insulin was given arter 10 P.M. All her subsequent urine examinations were normal. She stayed in the hospital for over a period of one month and at no stage she had glycosuria or raised blood sugar level and did not need any insulin at any time.

COMMENTS AND DISCUSSION

Clinical features - Most of the cases, as described in the literature, occurred in the elderly (50 to 70 years) with preponderance in the females in the ratio of 2:1 (Halmos *et al., loc. cit.*). Vinik *et al.* (*loc. cit.*) gave a wider range of occurrence as 16 to 70 years, though the cases occurring in early childhood (Ruben *et al.*, 1969) and a case occurring in a 18-month-old child (Ehrlich and Bains, 1967) have also been described. In 1/3 of the cases there is a history of maturity onset type of diabetes in the recent past while in the remaining 2/3 of the cases no such history may be available (Gierch *et al., loc. cit.*). The onset in the majority of the cases is insidious with polyurea, polydipsia extending over a few days and the patient becoming confused, disoriented and finally slipping into coma, though not invariably, the duration of symptoms extending between one day to two weeks (Vinik *et al., loc. cit.*). Wide range of neurological manifestations, besides confusion, stupor and coma, have been recorded and these include focal and generalised seizures (Maccario *et al.*, 1965; Daniels *et al.*, 1969) and varying degrees of paresis, hemiplegia, quadriplegia, etc. (Dibendetto *et al., loc. cit.*; Jackson and Forman, *loc. cit.*). The most useful pointer to the diagnosis in such cases is the absence of keto-acidoses, deep Kussmaul type of acidotic breathing and acetone smell in the breath in the presence of glycosuria and high blood sugar level.

The real interest during the past few years has been the recognition of more and more precipitating factors and these include drugs, high carbohydrate intake and many clinical conditions. Among the drugs which have been implicated are glucocorticoid therapy, thiazide group of diuretics and ethycranyic acid (Boyer, *loc. cit.*; Solvsteen *et al., loc. cit.*), intravenous dilantin (Goldberg and Sanbar, 1969) and corticoid and immunosuppressive therapy (Spenney *et al.*, 1969). High carbohydrate intake has been blamed by many (DiBendetto *et al., loc. cit.*; Solvsteen *et al., loc. cit.*; Macaulay, *loc. cit.*) even a non-sugar like sorbitol in peritoneal dialysate (Raja *et al.*, 1970) has been known to precipitate this condition. Many other clinical conditions are known to be associated with and have been blamed to precipitate hyperosmolar non-ketotic coma, and those mentioned in the literature are infections, sepsis, renal conditions, congestive heart failure, heart stroke, myocardial infarction, pancreatitis, etc.

The present case followed immediately after caesarian section. The diagnosis was considered when the patient failed to regain consciousness three hours after stopping the general anaesthesia and the coma went on becoming more and more deeper. At this stage her urine examination gave brick red reduction with Benedict's solution and was negative for ketone bodies.

The signs and symptoms in this condition are believed to be due to hyperosmolarity of extracellular fluid giving rise to intracellular dehydration of the cells of the central nervous system.

Hyperosmolarity itself is mainly due to hyperglycaemia and dehydration and to some extent due to hypernatraemia and high blood urea in the later stages.

Stress from any cause acts in two ways. Stress initially increases the endogenous catecholamines secretion which further diminishes the secretion of insulin from beta cells of the pancreas and in later stages it increases the secretion of corticoids which may further blunt the hypoglycaemic action of insulin. Probably the stress of operation and anaesthesia combined with dehydration produced by inadvertent restriction of water intake in this patient, who probably, already was suffering from latent diabetes, precipitated the coma.

Hyperglycaemia, however produced, further exhausts the beta cells of the pancreas already producing insufficient insulin and further accentuates the hyperglycaemia. Blood sugar values as high as 2200 mg. per 100 ml. of blood and as low as 460 mg. per 100 ml. of blood have been recorded in the literature (DiBendetto *et al., loc. cit.*). The blood sugar in the present case was 460 mg. per 100 ml. of blood.

As excessive osmotic diuresis continues there is further dehydration and hypovolaemia and ultimately circulatory collapse follows in the later stages. This adversely affects renal function and blood urea may rise which, in very late stages, may contribute further to hyperosmolarity.

Hyperosmolarity, thus produced, causes withdrawal of fluids from inside the cells. This intracellular dehydration of central nervous system cells is believed to be the cause of all neurological manifestations.

Hyperosmolarity also causes increase in the viscosity of blood and slowing of the circulation. Both these factors increase the tendency of intravascular clotting which may further be accentuated in the atherosclerotic vessels in the elderly (Whelton *et al.*, 1971).

The absence of keto-acidosis has been a subject matter of much discussion. The most accepted view till now has been (Johnson *et al., loc cit.*; DiBendetto *et al., loc. cit.*) that there is a small amount of insulin circulating in the blood which causes hyperglycaemia but is not sufficient enough to prevent keto-acidosis. As a matter of fact a very small amount of insuin is required to prevent keto-acidosis. It has roughly been calculated that 1/10th of the insulin, required to prevent hyperglycaemia, is required to prevent keto-acidosis. Further, hyperglycaemia (DiBendetto *et al., loc. cit.*) and dehydration (Johnson *et al., loc. cit.*) in themselves may be antiketogenic. In recent years more and more emphasis is being laid on fat metabolism to explain keto-acidosis. Seftel *et al.* (1967) found very high levels of free fatty acids in the blood and suggested that there is a block in the uptake and degradation of free fatty acid by the liver. Arief and Carroll (*loc. cit.*) found lower levels of free fatty acid and attributed this to a low level of circulating insulin in the blood inhibiting lipolysis. Gierch *et al.* (1971) found low levels of both free fatty acid and lipolytic hormones i.e., cortisol and growth hormone in the blood of these cases. They suggested that low levels of these lipolytic hormones inhibited free fatty acid formation in non-ketotic coma.

Mortality—Mortality, as noted in the literature, is high in the vicinity of 40 to 50 per cent (DiBendetto *et al., loc. cit.;* Solvsteen *et al., loc. cit.*) but this is likely to improve with greater awareness of the condition, e.g., early diagnosis, better understanding of the underlying pathophysiological mechanisms and prompt management of the patients. Gierch *et al.* (1970, 1971) recorded a mortality of 20 per cent in their cases.

Management—The proper management of these cases hinges upon the administration of the amount of correct fluid to reduce the hyperosmolarity and meeting the insulin requirement, both of which may be enormous in a few cases. There appears to be a fair degree of unanimity on the choice of correct fluid which now is believed to be hypotonic saline, 0·45 per cent (DiBendetto *et al., loc. cit.;* Solvsteen *et al., loc. cit.;* Lucas *et al., loc. cit.;* Gierch *et al., loc. cit.*).

Enormous amounts of the fluid may be required. Lucas *et al.* (*loc cit.*) used 17 litres of fluid in 12 hours in one of his cases though the individual requirement may depend on the degree of dehydration. Further, infusion should be rapid as the movement of water inside the dehydrated cells may further deplete the extracellular fluid, and further cause hypovolaemia. Another point that needs mention is that hypotonic saline should be replaced by isotonic dextrose as soon as blood sugar levels return to normal values and nasogastric feeding should be started as soon as possible.

Treatment of hyperglycaemia may need generous use of insulin though Hayes and Woods (*loc. cit.*) claimed that none was required in their case. Since hyperglycaemia is one factor, albeit an important one contributing to hyperosmolarity, its early correction should be the prime aim in the management of such cases. To start with, 50 units of soluble insulin are given intravenously and 50 units intramuscularly. Subsequent doses will depend on the blood sugar estimations done at hourly intervals. High doses of insulin in the presence of hyperglycaemia will induce potassium to move inside the cells and this may further accentuate extracellular hypokalaemia. The requirement of potassium should be monitored and adjusted accordingly.

SUMMARY

A case of hyperosmolar non-ketotic coma is described when the patient, probably suffering from latent diabetes, slipped into coma after a surgical procedure (caesarian section) without regaining consciousness after general anaesthesia. Inadvertent restriction of water coupled with the stress of the operation and anaesthesia probably precipitated the coma in this case. The literature is briefly reviewed and broad outlines of management of such cases are discussed.

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Syntocinon (Sandoz) brand of oxytocin was used.

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2

Clinical Tuberculoma of Pons Presenting as Foville's Syndrome

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The incidence of tuberculoma of the brain has been found to be significantly high in various parts of India (Ramamurthi and Varandarajan, 1961 ; Dastur and Desai, 1965 ; Dastur *et al.*, 1968). This granuloma may involve any part of the brain but occurs more often in the infratentorial portion. Depending upon its location it may produce various combinations of signs and symptoms. The present case had all the characteristic features of Foville's syndrome, which is an unusual and uncommon clinical presentation. There was ipsilateral lower motor neurone type of facial palsy, an ipsilateral paralysis of lateral rectus and lateral gaze and a contralateral hemiplegia with impairment of proprioceptive and tactile sensations. This syndrome is caused by a lesion in the dorsocaudal part of the pons by involving the root fibres of the facial nerve, the abducent nucleus, the vestibular fibres coursing through the abducent nucleus and areas adjacent to the contralateral medial longitudinal fasciculus, the pyramidal fibres and medial leminiscus

CASE REPORT

A. S., 25 years, Hindu, male, was admitted to the Hospital on 4-8-1970 with the history of progressive weakness of left upper and lower limbs for 4 months, diplopia on right lateral gaze since one month and watering from the right eye since 15 days. There was no history of fever, cough, night sweats, diminished vision, headache, vomiting or convulsions. On examination, the patient looked slightly emaciated and was fully conscious with normal mental functions. Fundi were normal.

Other neurological findings were: Right lateral gaze palsy, right lateral rectus paralysis, right sided facial palsy of lower motor neurone type, left sided paralysis of upper and lower limbs with spasticity, exaggerrated deep tendon reflexes, and an extensor plantar response and impairment of joint position, vibration and tactile sensations on the left side.

Investigations Blood: (a) E.S.R.—18 mm. in first hour (Westergren method). (b) Total leucocyte count · 4800/c.mm. with polymorphs—64 per cent, lymphocytes—24 per cent, monocytes—10 per cent and eosinophils—2 per cent. (c) Haemoglobin—10 g. per cent.

Urine: Albumin—nil, sugar—nil and microscopic examination revealed no abnormality.

Blood for Kahn test—negative.

Lumbar puncture: C.S.F. was clear with a pressure of 120 mm. of water. cell—4-5 lymphocytes/c.mm., proteins —42·5 mg. per cent, chloride—702·8 mg. per cent, sugar —37·9 mg. per cent and CSF for Kahn test—negative.

X-ray of chest—N.A.D., x-ray skull—N.A.D. and retrograde brachial-vertebral angiography was unsuccessful (not repeated because the patient started showing improvement with antituberculous chemotherapy.

Treatment—The treatment adopted in this case was as follows: Injection streptomycin 1 g. daily i.m. for 3 months together with isoniazid 300 mg. daily. He was also given physiotherapy at the same time.

With the above regime the patient started showing improvements within 2-3 weeks and was symptom-free at the end of 3 months, but a few abnormal signs persisted. On subsequent examination during follow-up there was no abnormality.

DISCUSSION

Tuberculoma is one of the commonest intracranial space occupying lesions in our country, next in frequency to gliomas (Dastur *et al.*, *loc. cit.*). Out of a total of 373 verified cases of space occupying lesions 35·5 per cent were tuberculomas in a study by Dastur and Desai (*loc. cit.*), 21·5 per cent in a later report by Dastur *et al.* (*loc. cit.*), 18 per cent in the series of Sinh *et al.* (1968) and 19·4 per cent in the study of Ramamurthi and Varandarajan (*loc. cit.*). The incidence reported from Europe and North America is comparatively much lower now, but was high in the past. Garland and Armitage (1933) found tuberculoma of the brain in 34 per cent cases in an analysis of *post mortem* material of the period 1910-1931. Asenjo *et al.* (1951) from Chile reported tuberculoma in 15·9 per cent cases in an analysis of verified brain tumours, and Arseni (1958) from Rumania reported an incidence of 7·3 per cent.

Tuberculomas were found to occur more often in females, and the age of maximum incidence was below 25 years. The average age of a patient with tuberculoma is about 14·7 years (Dastur *et al.*, *loc. cit.*). These lesions are more commonly located in the infratentorial region. Nearly 52 per cent of all tuberculomas and 63 per cent of those in children occur in the infratentorial region, cerebellum being the most common site (Dastur *et al.*, *loc. cit.*). The incidence of brain stem tuberculoma reported by Arseni (*loc. cit.*) was 1·5 per cent, and by Dastur *et al.* (*loc. cit.*) 4·1 per cent, out of a total of 195 tuberculomas reported. The anatomical diagnosis in an unoperated case is based on the focal signs, while the aetiological diagnosis is largely presumptive. Constitutional symptoms like fever and loss of weight are of infrequent occurrence, as was seen in the present case and are therefore of not much significance in making the diagnosis of a tuberculoma. The presence of tuberculosis elsewhere in the body makes it more likely that the intracranial lesion is also of the same nature, but at times intracranial tuberculomas have been diagnosed and detected *post mortem* in cases who had no other evidence of tuberculosis in the body. There was, however, no evidence of active tuberculosis in the lungs or in any other place in the present case. ESR may be elevated and many a times this elevation is marginal as is evident from

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this case This observation also, therefore, is not of much diagnostic help.

In the management of tuberculomas, chemotherapy has considerably improved the results obtained after surgery and has also provided a means of effective conservative therapy in selected cases e.g., when the location of the tuberculoma is in the surgically inaccessible site or in cases who decline surgery for some reason or other. In the present case since the tuberculoma was situated in the pons which is a surgically inaccessible site, it was decided to manage the patient with chemotherapy, with which he showed remarkable improvement. It would, therefore, seem reasonable to suggest that if a patient in our country presents with the clinical features of progressive brain stem pathology suggesting the diagnosis of space occupying lesion, it would be desirable to give the patient the benefit of doubt by giving antituberculous chemotherapy on the assumption of its being a tuberculoma.

SUMMARY AND CONCLUSION

A case of Foville's syndrome due to pontine tuberculoma, successfully treated with antituberculosis drugs, is reported to emphasise the point that in all those cases of space occupying lesion in the brain which are situated in sites inaccessible to surgery (e.g., the brain stem) or occasionally, when a patient declines surgery, antituberculosis drugs should be given on the assumption of these being tuberculomas in view of their frequency of incidence in this country. There is a lot of justification in giving these patient the benefit of doubt for a potentially treatable condition. The present case report illustrates the soundness of this statement.

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We are thankful to Dr. R. P. Chaturvedi, Principal, R. N. T. Medical College and Dr. S. V. Singh, Superintendent, General Hospital, Udaipur, for allowing us to publish this case report.

Isonex (Dumex) brand of isoniazid was used.

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3

Osteoid Osteoma

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The term osteoid osteoma was first introduced by Jaffe (1935) who reported 5 cases to describe a group of bone lesions that microscopically consisted of a core or nidus of osteoid tissue and atypical bone. Such cases had previously been wrongly classified as cortical bone abscess. Since then numerous reports have been published from time to time and unquestionably the clinical, radiological and structural features when taken together are sufficiently specific to distinguish it as a separate entity (Evans, 1966).

CASE REPORT

H. C., aged 27 years, male (B.H.T. No. 494 E) had an injury over the right medial malleolus in 1968 and the patient complained of pain since then. He had another injury on 15-1-1970 when there was a lacerated wound over the right medial malleolus, but no fracture and it was stitched. The pain was markedly increased after this injury and it now became constant and boring in character, worse at night and at times severe. Slightest touch of clothes over the right medial malleolus caused the shooting pain. This pain was relieved on administration of acetylsalicylic acid. He also noticed a swelling over the medial malleolus after this injury and he started limping. Examination revealed a palpable thickening and tenderness over the whole of right medial malleolus but it was attributed to the recent injury. There was one inch wasting of the right calf muscle. Regional lymph nodes were not enlarged. Osteoid osteoma was suspected.

Investigation — X-ray showed a small radio-opaque nodule 5 mm.×4 mm. in size within the cortex of the right medial malleolus. The characteristic radiolucent central nidus could not be demonstrated in this case

A diagnosis of osteoid osteoma was made and the patient was operated upon.

Postoperative x-ray on the table showed complete disappearance of the tumour..

A block of about 2 cm.×2 cm. bone was excised and sent for histopathology. The slide showed that the tissue was made up of confusedly interwoven network of small, irregular, thin, uneven and unequally calcified osteoid trabeculae, some undergoing conversion into atypical bone rimmed by osteoid tissue and osteogenic connective tissue. At other places the trabeculae appeared to be quiescent, mature and non-proliferating. The diagnosis of osteoid osteoma was confirmed. The patient made an un-

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eventful recovery and stated that the pain had disappeared as soon as he regained consciousnes after the operation.

DISCUSSION

This condition is most frequently seen in children and young adults between the age of 10-25 years and is uncommon after the age of 30 years. It is twice more common in males. The bones commonly affected in decreasing order of frequency are tibia, femur, vertebrae, humerus, talus, phalanx (foot and hand), calcaneum, fibula and raidus (Dockerty *et al.*, 1951 ; Freiburger *et al.*, 1959 ; Jaffe, *loc. cit.*). No lesion in the skull and ribs have been described to date (Shankaran, 1954 ; Robbins, 1962) or in the mandible (Shankaran, *loc. cit.*). However, Lichtenstein (1959) reported on a single case of 12th rib involvement and Lapidus and Salem (1949) reported a case with 2 lesions in one femur, though only one could be confirmed pathologically.

The onset is insidious and the principal symptom is pain which is persistent but usually not of sufficient intensity to bring the patient under observation until several weeks or months have elapsed after the onset (Anderson, 1966) or even up to 2 years (Lichtenstein, *loc. cit.*). The pain which is localised and boring in noture, often worse at night is unaffected by rest and exercise (Lichtenstein, *loc. cit.*). Acetylsalicylic acid is believed to relieve the pain dramatically for varying periods and this has been mentioned as a diagnostic feature in the literature.

Clinical examination reveals a point of localised tenderness and a slight swelling at the site of the lesion (Anderson, *loc. cit.*) which may or may not be present. Local erythema and a rise of temperature are unusual. A small but significant number of patients with osteoid osteoma presents with neurological features as well as with joint disturbances before the bone findings are manifested (Phelan, 1965). When the lower limb is involved the patient usually develops a limp and a definite wasting of muscles may be present resulting from disuse atrophy (Graham, 1966 ; Denlin, 1967). Fever is absent and routine investigations (total and differential leccocyte counts and ESR) are within normal limits (Anderson, *loc. cit.*).

Roentgenological features—Typically, there is a radiolucent nidus, spherical or oval in shape, measuring from 0·5 to 2 cm. in diameter, surrounded by a zone of dense osteosclerosis. In our present case, the impression that is conveyed on examining the x-ray is that the lesion is radio-opaque whereas in fact the lesion is radiolucent. The reason for this has been attributed by Shankaran (*loc. cit.*), to the dense osteosclerosis around the small nidus which may be so intense in radio-opacity that it may often completely mask the area of translucency in the bone. The amount of surrounding zone of osteosclerosis depends upon the site of osteoid osteoma and the type of bone involved. It is most marked when the lesion is in or near the cortex of a long bone and least in cancellous bone (Fowler, 1964). Where the lesion is situated near the periosteum, the resultant periostial reaction assumes an onion peel appearance, typical of Ewings' sarcoma (Dockerty *et al.*, *loc. cit.*). Tomography is useful in difficult cases. Very often, the x-ray picture appears later than symptoms for some months or even a year (Lichtenstein, *loc. cit.*).

Pathology — (a) Macroscopically, the lesion is small, rarely more than 1 cm. in size, reddish brown, fairly discreet, firm nodule with a central "nidus" localised in either cancellous or cortical bone (Robbins, *loc. cit.*) or rarely subperiosteally.

(b) Microscopically, the nidus is made up of a confusedly interwoven network of small, irregular, generally thin and unevenly and unequally calcified osteoid trabeculae, some undergoing conversion into a typical bone rimmed by osteoid tissue. This triangle of osteoid trabeculae is set in a vascular osteogenic connective tissue that occasionally contains a few or many plasma cells. The impression usually gained is one of disorderly activity with obvious new bone formation and destruction. Osteoblast like cell may be numerous throughout the tissue and osteoclast like giant cells prominent in some areas (Sherman, 1947 ; Sevitt and Horn, 1954). The fine trabeculae of the nidus are distinctly separated from thick sclerotic but essentially normal bony trabeculae. that surround the lesion (Evans, *loc. cit.*). Plasma cell or lymphocytic infiltration has also been seen in some cases but not enough to suggest infection.

Aetiology—The widely held view is that it is a benign neoplastic condition, but it lacks the progressive growth, besides, if left alone, it could heal spontaneously (Sherman, *loc. cit.*; Moberg, 1951 ; Golding, 1954). However, the time taken to heal is unpredictable and may vary from 2 to 24 years. The pain gradually disappears and the surrounding sclerosis lessens but does not disappear completely (Vickers *et al.*, 1959, cited by Fowler, *loc. cit.*).

SUMMARY AND CONCLUSION

A case of osteoid osteoma has been reported. Though it is by now an established clinical entity but there are still a number of questions which have not been satisfactorily answered till date, but these do not relate to the identity of the lesion:

(1) Why is the lesion so small as a rule? (2) Why is it invariably painful? (3) What would happen to the lesion ultimately if it were left alone? (4) What is the effect of x-ray irradiation upon it (Lichtenstein, *loc. cit.*)? In course of time, however, the last question has been answered and it has been established that with radiotherapy recurrences and osteogenic sarcoma have been reported (Pack and Ariel, 1964). We look forward to the day when the other three questions would be answered satisfactorily as well.

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4

Association of Polycythaemia, Polycystic Kidneys, Diabetes Mellitus and Portal Hypertension

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A large number of diseases is known to cause secondary polycythaemia. A comparatively new addition to the list of causes is renal disease. Bliss (1929) first described a case of hypernephroma with polycythaemia. However, he failed to recognise the causative role of the former and considered it as a coincidental occurrence. Now it is well established that about 10 per cent cases of hypernephroma have polycythaemia (de Wardner, 1963). The association of polycystic disease of kidneys and polycythaemia has been documented infrequently since then (Kurrle, 1954; Nixon *et al.*, 1960; Friend *et al.*, 1961). The relationship between the renal disease and polycythaemia is causal and not coincidental since palliation of renal lesion by surgery, is followed by remission of the latter. Thus, partial or complete nephrectomy in cases having renal cysts resulted in remission in polycythaemia (Forsell, 1958; Jones *et al.*, 1960; Nixon *et al.*, *loc. cit.*; Kurrle, *loc. cit.*). Brandt *et al.* (1963) investigated 91 cases of polycythaemia vera for kidney lesions and found only two examples of bilateral polycystic disease out of 19 cases having renal lesions.

We wish to record a rare case of renal polycythaemia with bilateral polycystic disease of the kidney complicated by diabetes mellitus and portal hypertension.

Case Report

R. R., 61 years, male, was admited with us with the chief complaints of polyuria, polydipsia and polyphagia of 10 months duration and generalised weakness for the last 3 months. He was conscious of a gradually enlarging mass in the left hypochondrium for the last 3 months. There was no history of painful micturition, haematuria, paraesthaesiae. Past, personal and family histories were non-contributory

Physical examination revealed a moderately built and nourished individual with ruddy facial appearance and reddish blue discolouration of tip of the nose and tongue. Palms were also ruddy. Mild cyanosis was apparent. Neck veins were engorged and jugular venous pressure was raised. There were a few purpuric spots and ecchymotic patches scattered all over the body. Eyes were congested. Pulse rate was 90/minute with occasional irregularity, and blood pressure was 150/110 mm. Hg. Examination of the heart revealed a grade I systolic murmur and a triple rhythm in the left parasternal region. Chest examination revealed occasional rhonchi. Upper border of the liver was in the 7th intercostal space in mid-clavicular line and lower border was 4 cm. below the costal margin. The liver was smooth, firm and nontender. The spleen was palpable 10 cm. below the costal margin, firm in consistency. Right kidney was palpable, greatly enlarged in size with irregular surface Left kidney could not be palpated because of the big spleen. Fundus examination revealed myopic degeneration with no evidence of hypertensive retinopathy.

Investigations — Haemoglobin (venous blood) 20·1 g./100 ml. (Sahli's method), red blood cell count--7·6 million/c.mm.. total leucocyte count—12,400/c.mm. (normal 4 to 11·000/c.mm.) with polymorphs 70 per cent, lymphocytes 28 per cent and monocytes 2 per cent. Platelet count — 4,02000/c.mm., reticulocyte count — 0·8 per cent, packed cell volume—76 per cent (Wintrobe method), erythrocyte sedimentation rate 3 mm. 1st hour (Westergren), bleeding time 4′ 30″, clotting time 4′ 15″. Serum iron level was 145 μg./100 ml.; blood volume estimated by dye method (Evans blue) was 9458 ml. Urine analysis revealed albuminuria (1+) and glycosuria (4+) with occasional leucocyte per high power field. Blood sugar level was 200 mg./100 ml., blood urea--37 mg./100 ml., serum uric acid—4·4 mg./100 ml. and serum chloestrol—166 mg./100 ml. Prothrombin time was 30 seconds and prothrombin index 50 per cent. Serum bilirubin level was normal and flocculation test failed to reveal any evidence of parenchymal hepatic damage. Basal metabolic rate was raised +34 per cent (normal ± 15 per cent).

Electrocardiogram showed pattern of left ventricular hypertrophy. Skiagram of chest and abdomen were normal. Barium swallow revealed the presence of oesophageal varices whereas the stomach and duodenum were normal. Intravenous pyelography showed changes suggestive of bilateral polycystic disease of kidneys. Study of bone marrow revealed increased normoblastic reaction

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with numerous megakaryocytes, most of them in inactive phase and normal cellularity of the leucocytes. Liver biopsy was unsuccessful while splenic puncture was not contemplated since the patient's condition never allowed us to do this potentially hazardous procedure.

DISCUSSION

The subject of association of polycythaemia and renal carcinoma has been reviewed by Damon *et al.* (1958). A few report of polycystic disease of kidney with polycythaemia have also been recorded (Forssell, *loc. cit.*). This combination is probably commoner than the case reports suggest because it has been described under other headings by earlier workers.

The frequency of association of polycythaemia with various renal lesions has ranged from 0·3 to 2·6 per cent cases in various series (Harrison, 1966). Renal polycythaemia should be suspected in a patient whose polycythaemia is associated with normal arterial saturation with no increase in white cells or platelets and no splenic enlargement (Osnes, 1958). However, a number of cases may have leucocytosis and thrombocytosis (Jaworski and Hirte, 1961). Moreover, in a few patients, nephrectomy has been followed by a remission of polycythaemia in cases having leucocytosis, thrombocytosis and splenomegaly with renal lesions (Lawrence and Donald, 1959). In addition, an episode of haematuria points towards renal origin of the disease. In our case, no history of haematuria was forthcoming and the platelet count was within normal range. Splenomegaly was attributed to portal hypertension because of the presence of oesophageal varices. Cirrhosis of the liver is well known to occur in polycythaemia termed as "Mosse's syndrome" (Whitby and Britton, 1963). However, in the absence of liver biopsy report and normal liver function tests, splenomegaly could also be attributed to polycythaemia vera.

In 1905, Gaisbock described polycythaemia hypertonica characterised by hypertension, arteriosclerotic renal disease, and often cardiac hypertrophy and absence of splenomegaly. As already pointed out, some of these cases may indeed have been cases of renal polycythaemia as those of Kurrle (*loc. cit.*). Perhaps, Gaisbock's syndrome is a true entity of renal polycythaemia not associated with splenomegaly. Luke *et al.* (1965) further suggested that one should always look for polycythaemia in all cases of renovascular hypertension. Most authors argue that the absence of leucocytosis, thrombocytosis nad splenomegaly suggest renal polycythaemia although the validity of this view is questioned by Brandt *et al.* (*loc. cit.*). Our case, in many ways, resembles other cases of polycystic kidneys associated with polycythaemia, as reported by Kurrle (*loc. cit.*), Forssell (*loc. cit.*), and Jones *et al.* (*loc. cit.*). Polycystic disease of kidney associated with polycythaemia may be unilateral as in 3 of the 6 cases recorded by Jones *et al.* (*loc. cit.*). Jones *et al.* (*loc. cit.*) studied bone marrow in 10 patients suffering from nonneoplastic renal lesions; evidence of increased erythropoiesis was observed in 5 of them. In our cases too, bone marrow showed increased normoblastic reaction with no increase in myeloid activity.

The mechanism of occurrence of polycythaemia in renal disease is uncertain. An increase in renal tissue mass may be associated with increased red cell production. Penington (1962) suggested that nephrons respond to decreased perfusion by an increased production of erythropoietin. The latter is a mucoprotein which stimulates erythropoiesis. Osnes (*loc. cit.*) postulated that the juxtaglomerular apparatus might be the site of erythropoietin and renin production. This hypothesis has been supported by Hirashima and Takaku (1962) on the basis of their experimental work. Luke *et al.* (*loc. cit.*) observed that the erythropoietin production could be stimulated by a reduction in renal blood flow rather than by renal parenchymal disease *per se.*

SUMMARY AND CONCLUSIONS

An interesting case of polycythaemia, bilateral polycystic disease of kidneys with associated portal hypertension and diabetes mellitus is presented. The relevant literature is reviewed and the characteristics of renal polycythaemia are stressed. The entity appears to occur more frequently than the case reports suggest since earlier workers failed to appreciate the causative role of associated renal lesion in cases of polycythaemia.

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Basic Medical Sciences and Surgical Studies

The changing relationship between the basic medical sciences and surgery in recent times is reflected by the subtle change in the definition of the word 'surgery'. Its time honoured definition as the art of treating injuries, deformities and other disorders by a manual operation or instrumental appliances is now being replaced by the one proposed by Lord Brock in 1967, as the science of understanding, and the act and art of controlling or modifying usually by a manual operation, the response of the body to disease or injury. Lord Brock pointed out that surgery comprised three components; the crude act of surgery, which historically appeared first: then the art of surgery: and finally the science of surgery, introduced mainly through the work of John Hunter at the end of the 18th century and that of Lister a century ago.

The science of surgery has over the last two centuries gradually been built up on three basic medical sciences of anatomy, physiology and pathology but this traditional tripod is no longer able to sustain its phenomenal growth over the last few decades. Almost all scientific disciplines, physical, biological and behavioural have contributed to the present state of surgical services. It is therefore becoming more and more necessary that a surgeon devotes a considerable portion of his time to the study of basic sciences irrespective of whether he chooses to engage in the pedestrian practice of doing the greatest good to his patients, or in extending the frontiers of surgical science. The latter activity has incidentally resulted in a tremendous accretion of knowledge in many basic disciplines, knowledge that would have been hard to come by in the absence of surgical endeavour.

The education of a surgeon in basic sciences commences in the secondary school and in the premedical course, long before he seriously contemplates taking up surgery as a career. It is continued in right earnest in the undergraduate medical curriculum. In this period about half the total available time is universally devoted to basic disciplines, but the curriculum is designed in different ways in different countries, and even in different institutions in the same country. The end result of this course is what is called in this country, the basic doctor. After this, begins the third and most important phase of surgical education; the transformation of the basic doctor into a trained surgeon. There seems to be universal agreement that the study of basic medical sciences should play an important part in this metamorphosis, but considerable disagreement about the precise methodology.

One of the methods in vogue in the western hemisphere and the European continent is to arrange employment for the surgical trainee in one or other basic science department for a varying length of time, after which he automatically reverts back to a surgical post. Another method is to make it obligatory for a candidate to spend some time in a laboratory conducting a piece of investigation related to surgery. In the United Kingdom, the Royal Colleges of Surgeons assume most of responsibility for the training and assessment of surgical neophytes. These colleges have organised Departments of Basic Medical Sciences and have decreed that a candidate must satisfy a Board of examiners that he has sufficient knowledge of anatomy, physiology and pathology before he is allowed to appear in the final examination in Surgery. It is customary that surgeons and experts in basic medical sciences are equally represented on the Board of examiners: the examination is open to virtually all doctors and helps to weed out undesirables from continuing the pursuit of surgery. To enable the candidate to prepare for the examination, a variety of courses of instruction are available, all of which are optional.

In this country, postgraduate medical education remains in the hands of a very large number of autonomous universities and a few centrally administered institutes, and is very loosely supervised by the Medical Council of India. The Council recommended 2 years ago that for the Master of Surgery 'there shall be proper training in basic medical sciences *related to the discipline concerned* (italics, ours) as well as a paper in these subjects at the examination'. At the present time, some institutions follow the Council's recommendation in letter and spirit; many pay only lip service to them and pay very little attention to basic medical sciences; while a few attach to them an importance out of all proportion to what was in the Council's mind. The end result of all three systems in the Indian M.S. and in the eyes of the vast majority of employing agencies in this country and abroad, one Indian M.S. is as good as another. The Indian university which insists on following the British pattern of two examinations, Primary and Final, deserves the warmest congratulations and support, but its candidates are placed at a considerable disadvantage compared to their contemporaries of other centres if the additional effort they have to put in goes unrecognised.

The disadvantage is all the more acute if the Indian university tends to offer only one course in basic medical sciences which is prolonged, full-time, compulsory and uniform design, supposedly to suit the needs of all postgraduates, whether of surgery or of dermatology, and if it chooses to arrange for an examination in which the clinical teacher has little say.

On the other hand, the university that all but ignores basic medical sciences, places on the market a substandard product; though initially acceptable as the real thing, he will sooner or later be found wanting, unless he takes the trouble to make good his deficiencies subsequent to qualifying.

This then is the fourth phase of a surgeon's education his continuing education during the period of practice as a qualified surgeon. In this period, it becomes incumbent on all surgeons, particularly on surgical teachers, to keep abreast of new developments in the different sciences. For a busy surgeon this is indeed difficult. This difficulty has been reduced in many centres by arranging suitable refresher courses and by the practice of sabbatical leave, during which period a surgeon can leave his patients for a while and work out a project in a laboratory in collaboration with a colleague in a basic science department.

SUBIR K. CHATTERJEE

Medicine and Sports

In our country, physical education is an extra-curricular item i.e., a vacant and barren area within the existing educational system. A few States e.g., Punjab in particular and West Bengal to a certain extent are planning to have sports as a compulsory subject in school syllabus

It is high time that our national plans and programmes should be devoted to making sports the concern of everybody in a modest way, at least at leisure hours. The question in our country is how the uninterested, timid, retarded or the older age groups could be made to attain some performance (not gold medals) appropriate to their power.

At present we need mass participation in sports and physical activities with facilities under medical supervision for preventing the danger of injuries. A W.H.O. scientific group has pointed out that leisure-time physical activity is associated with a lower risk of ischaemic heart diseases and this has a well established place in the treatment of several diseases and disorders and plays a major role in medical and occupational rehabilitation. It also solves various juvenile, puberal and geriatric problems.

Exercise habits for physical fitness are best undertaken at an early age e.g., between 6 and 12 years. In developing motor skills, the endurance training (e.g., running) should not be neglected, since it will promote cardiopulmonary fitness besides the skills in diverse sporting activities. If there is a rise in maximal oxygen consumption, we can assume that we are improving cardiopulmonary fitness.

The chance of combating atherosclerotic cardiovascular diseases which is essentially a geriatric problem is likely to bear fruit if physical exercises are started early in life.

To make an effective combination, skilled physical educators and qualified trainers should work with trained sports doctors. Sports medicine, as a speciality, needs at least condensed courses in the universities to produce sports doctors. Physical educators should be qualified to teach health, physical education, biology, elementary hygience, etc. An average physician, especially those who are not sports-minded or have not played any games (including quite a number of parents), do not have the time or inclination or aptitude for making their wards sports-minded.

Nowadays, the main items of sports medicine are occupational and performance medicine, and these are making great progress, specially in highly developed countries.

Besides tackling the usual environmental, nutritional, traumatological, and physiological problems, the adviser on modern sports will have to be well versed in other aspects of sports science, i.e., its psychology, sociology, philosophy, methodology and kinesiology.

The recently concluded highly successfull IIIrd National Seminar on Sports Medicine held at Medical College, Calcutta, was attended not only by doctors but by eminent players, coaches, trainers, physical educators/culturists, masseur, physiologists, psychologists, sports journalists and sports administrators. The multidisciplinary approach of sports medicine needs the conjoint action of specialists in sports science as mentioned above.

Sports medicine in India is still in its infancy, while the affluent and developed countries have already come of age. Yes, we admit that we are lagging behind in this science, as in many other fields, but a beginning has been made in the right direction by the Indian Association of Sports Medicine. Besides, socio-economical aspects the Indian Association of Sports Medicine will have to fight a relentless battle against poverty, malnutrition and ignorance. Unlike our foreign colleagues, we will have to start with a handicap. This is that we are not getting healthy kids to mould.

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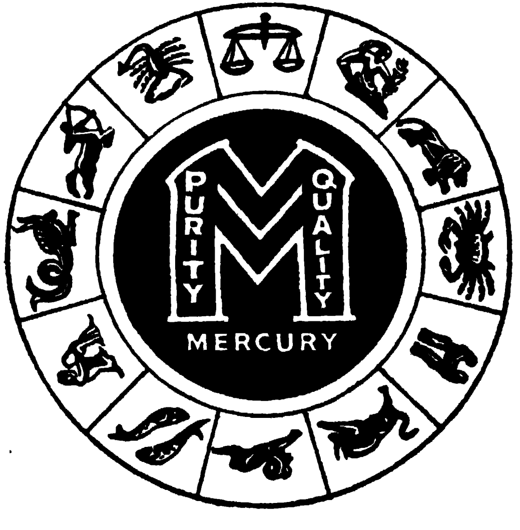

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3 BROTHERS

CURRENT MEDICAL LITERATURE

Body Temperatures After Rugby

DANCASTER, C. P. (*S. Afr. Med. J.*, **46**: 1872, 1972) from Grey's Hospital, Pietermaritzburg, observes:

Body temperatures of over 41°C have been recorded immediately after rugby games. Temperatures were higher on hot days early in the season, when nearly 70 per cent of the players had temperatures of over 40°C. In view of the possibility of heat-stroke, it is suggested that in the early season, if the air temperature is above 28°C at the commencement of the game, that as a minimum safety precaution each half should be restricted to 30 minutes, or that the early season games are played in the evenings.

In exercise, about three-fourths of the energy expended is converted into heat which is dissipated from the body by sweat evaporation. This is naturally a less efficient method of cooling on hot humid days than on cool days. After rugby on a hot day, players are often exhausted, particularly if they are not acclimatised to the local conditions.

The effects of air temperature and humidity on body temperatures have been studied after rugy, both at the beginning of the season and in the late season.

The main factors which have been shown to predispose to high body temperatures are high air temperatures and early season games, when players are not physically fit or acclimatised. These conditions are likely to be present at the commencement of the season in subtropical coastal areas, where early season games should be played in the evenings. Alternatively, if the air temperature is above 28°C at the commencement of play, as a minimum safety precaution, play should be restricted in each half to 30 minutes, instead of the customary 40 minutes. Even this precaution may not obviate the danger of heat-stroke, and it may be safer not to play early season games when the air temperature is above 28°C. In the event of a match being played in hot weather and a player collapsing, or behaving in a strange manner, the attending medical officer should suspect heat-stroke and take an immediate rectal temperature. If this is above 41°C, then the diagnosis is confirmed and the player should be immediately cooled until his rectal temperature comes down to 38°C. (An oral temperature in these conditions is quite misleading and is useless).

Emergency Surgery in the Geriatric Patient

JAVETT, S. L. (*S. Afr. Med. J.*, **46**: 2026, 1972) from Brenthurst Clinic, Parktown, Johannesburg, writes:

The results of an aggressive surgical policy in 44 patients over the age of 70 years are presented. There were 34 elective and 18 emergency operations. Thirty-five operations were considered major procedures. There were 8 deaths, 7 occurring in the emergency group, and all were major operations. During the period considered no patient was refused operation.

The combination of age and an elective operation, whether major or minor, is no hazard to the geriatric patient. Prophylactic elective surgery for groin hernia, symptomatic biliary tract disease and duodenal or gastric ulcer is recommended.

In geriatric patients the chance of survival with emergency surgery is just over 50 per cent in situations where conservative management may be associated with 100 per cent mortality. This figure is important when one is considering conservative management as a compromise, simply because the patient is regarded as 'too old for operation'.

Benefits from surgery in this age group may be dramatic and there is no justification for denying surgery. The difficulties of management should be seen as a challenge and not as grounds for conservative non-operative care in equivocal cases.

Saving the Amputated Digit and Hand

O'BRIEN, B. MCC., MILLER, G. D. H. MCLEOD, A. M. AND NEWING, R. K. (*Med. J. Aust.*, **1**: 558, 1973) from Plastic Surgery Unit, St. Vincent's Hospital, Melbourne, state:

Indications for replantation of fingers and hands are discussed. Success has been achieved in guillotine and moderate crush injuries but avulsion injuries have presented problems. A brief outline of the technical approach and postoperative management is given.

Twenty cases, involving 27 incomplete and completely amputated digits, have been treated. All 8 incompletely amputated ischamic digits have survived and 13 of 19 totally amputated digits were successfully replaced. In addition, 2 completely amputated hands and 1 incomplete and 1 complete below elbow amputation have survived.

Secondary surgery has been completed on the majority of patients with improved function and return to work. A long-term evaluation of hand function is necessary but the present results are encouraging, particularly in nerve regeneration.

The organisational aspect of a replantation team together with first-aid instructions are included, and the value of a multidiscipline type research programme stressed.

Asymptomatic Gonorrhoea in Women

ELLERMAN, L., FISHER, S., GILL, R. C., HYSLOP, R. S., JENNIS, F., O'CONNOR, B. F. AND OSBORN, R. A. (*Med. J. Aust.*, **1**: 289, 1973) from the Department of Bacteriology, The Women's Hospital, Crown Street, Division of Epidemiology, New South Wales Department of Health, Department of Gynaecology, The Hornsby and District Hospital, Department of Obstetric and Gynaecology, Liverpool District Hospital, Department of Microbiology, Sydney Hospital, Department of Microbiologist, Institute of Clinical Pathology and Medical Research, Lidcombe, and the Department of Pathology, Royal Hospital for Women, Paddington, write:

Cervical and urethral swabs were examined for *Neisseria gonorrhoeae* for 4,768 women. The reasons for attendance at various centres were for routine antenatal examination (1,411), cervical cancer check (1,075), general gynaecological examination (985) and family planning consultation (1,297). Five public hospitals and the Family Planning Association of Austrialia Clinic, all in Sydney, participated in the survey.

None of the subjects exhibited signs or symptoms suggestive of genital gonorrhoea. Gonococci were found in six patients; five of these were antenatal patients and one presented with vaginal bleeding. All isolations of *N. gonorrhoeae* were made from women aged 22 years or less. The incidence in this age group appeared to be disproportionately high.

Sodium Bicarbonate in Treatment of Osteomalacia

RICHARDS, P., CHAMBERLAIN, M. J. AND WRONG, O. M. (*Lancet*, **2**: 944, 1972) from Medical Unit, St. Mary's Hospital Medical School, London W. 2, Dudley Road Hospital, Birmingham and Medical Unit, University College Hospital Medical School, London W.C. 1, write:

Healing of osteomalacia in response to treatment with sodium bicarbonate alone was compared in two women with renal tubular acidosis. One had normal glomerular function, the other had chronic renal failure as a result of nephrocalcinosis and renal calculi. The bone pain of the woman with normal glomerular function was quickly relieved, and osteomalacia healed completely within one year of correction of acidosis by regular treatment with sodium bicarbonate. Acidosis was not completely corrected in the uraemic women; bone pain was relieved and psudofractures healed, but her serum-alkaline-phosphatase remained high during treatment with alkali until she was treated with a large dose of calciferol (vitamin D_2). It is suggested that osteomalacia in patients with renal tubular acidosis who are not uraemic should, in the first instance, be treated with alkali alone because of the dangers inherent in treatment with vitamin D.

Coal Mining and Cancer of the Stomach

MATOLO, N. M., GORISHEK, W. M., MOSLANDER, V. AND DIXON, J. A. (*Rocky Mountain Med. J.*, **69**: 44, 1972) from the Department of Surgery, University of Utah College of Medicine and the Utah State Tumour Registry, Rocky Mountain States Cooperative Tumour Registry, Salt Lake City, Utah, Observe:

Carbon and Emery Counties are soft coal mining regions. The incidence of gastric cancer in these two counties is five to six times that of adjacent Utah County, which has no coal industry, and three to four times that of the State of Utah and of the Uited States.

A detailed study of patients with gastric cancer in the coal mining region revealed that 52·2 per cent of patients in Carbon County and 28·6 per cent of patients in Emery County were coal miners. The gastric cancer incidence in coal miners was 15 times that in non-coal miners in Carbon and Emery Counties, but over 40 times that in non-coal miners in Utah and other non-coal mining counties. All the homes of patients afflicted by gastric cancer in both Carbon and Emery Counties were heated with coal, and in some of the homes coal was used for cooking. In Carbon County 39·1 per cent of gastric cancer patients were born in foreign countries.

In Utah County none of the gastric cancer patients were coal miners. Furthermore, the homes were heated with either natural gas or electricity. The age distribution, diet, socio-economic class distribution, and climate were similar in all three counties. Carbon County has a heterogenous population but Emery and Utah Counties have similar ethnic, religious, and social backgrounds.

It is concluded that there is a statistically significant high incidence of gastric cancer in Carbon and Emery Counties. Coal mining and the extensive use of soft coal in this area might be an aetiologic factor.

Ulcerative Colitis and Clubbed Fingers

PERRY, P. M., EVANS, G. A. AND DAVIES, J. D. (*Dis. Colon Rectum*, **15**: 278, 1972) from the Departments of Surgery and Pathology, St. Bartholomew's Hospital, London, E.C. 1, England, comment:

In a retrospective study of patients with regional ileitis or ulcerative colitis, it was found that 23 of a total of 68 patients with the histologic diagnosis of regional ileitis, confined to the area of the gut supplied by the vagus nerve, had clubbed fingers. The marked fibrosis in regional ileitis may well be a factor in the reflex mechanism responsible for clubbing of the fingers. By contrast, only three patients of a total of 77 with the histologic diagnosis of ulcerative colitis had clubbed fingers, and two of these patients had associated hepatic cirrhosis.

Effect of Oxyphenbutazone on Liver Function

PENTIKAINEN, L. A. AND MUSTALA, O. O. (*Ann. Clin. Res.*, **4**: 296, 1972) from the Medical Department of Kivela Hospital, Helsinki, and Second Department of Medicine, University of Helsinki, Helsinki, Finland, comments:

The effect of oxyphenbutazone on liver function tests has been studied in patients both with and without liver disease. After treatment with oxyphenbutazone for 10 days (600 mg./day) a significant decrease of bilirubin levels and an increase of BSP retention time were observed. In both instances, the magnitude of the change varied directly with the amount by which the initial values varied from the normal. These changes became more prominent when a 20-day treatment schedule was followed by an increased dosage (1200 mg.) on days 11-20. A single dose of oxyphenbutazone (400 mg.) had no effect on bilirubin or BSP values in patients with liver disease. In no instance were there changes in SGQT, SGPT, LDH or alkaline phosphatase levels.

Working Capacity in Severe Chronic Obstructive Lung Disease

TAMMIVAARA-HILTY, R. (*Upsala J. Med. Sci.*, **77**: 189, 1972) from the Departments of Clinical Physiology and Pulmonary Diseases, University Hospital, Uppsala, Sweden, states:

Twenty-five patients (mean age 61·2, range 39-72 years) with severe chronic obstructive lung disease, with a maximum voluntary ventilation MVV_F), without bronchodilating spray, $\geqslant$ 35 per cent of the individually predicted normal value, were classified into two groups: (1) a group who had suffered from at least one period of absolute respiratory insufficiency (R), with 8 men and 6 women, and (2) a comparison (C) group with the corresponding degree of MVV_F limitation but without any period of absolute respiratory insufficiency, with 10 men and 1 woman. The patients were studied in their habitual state by a standard ergometrebicycle exercise test. The highest performed work load, near maximal (W_{max}), was determined, and also the pulmonary gas exchange, arterial-blood (O_2 and CO_2) gas tensions, lactate concentration and acid-base balance under the conditions of maximum work load.

MVV_F, and W_{max} were found to be positively correlated in the R and C groups, but not in the female patients. W_{max} was also correlated to other factors, namely negatively to resting (lowest functional residual) FRC/TLC and RV/TLC (residual ratio), and to V_D/V_T (physiological dead space ratio) measured under maximum working conditions. Average W_{max} was 189±52 in the male R group and 118±37 kpm/minute in the female, and in the male C group 256±40 kpm/minute. W_{max} in kpm/minute per kg. body weight was in the R group 2·63±0·57 and in the C group 4·29±0·65. There was a tendency to lower PaO_2 and CaO_2 during maximum work and higher heart rate in relation to work load in the R group than in the C group although this was not statistically significant.

Trimethoprim-Sulphamethoxazole in Urinary Tract Infections

DUNGAN, R. W. (*Med. J. Aust.*, **1**: 536, 1973) from 117 Millswyn Street, South Yarra, Vic. 3141, states:

One hundred and sixty-seven patients with symptoms of urinary tract infection were treated with courses of trimethoprim and suphamethoxazole for up to 14 weeks. By the very nature of the practice, the patients admitted to the trial tended to be those suffering from chronic and intractable infection, which tested the efficacy of the combination in realistic conditions.

The success rate for the usual simple *Escherichia coli* infections was 94 per cent. Twenty-six per cent of patients in the group as a whole achieved sterile urine at two weeks, while, with prolongation of treatment to 14 weeks, sterile urine was achieved by 63 per cent.

Unwanted effects, which may or may not have been related to the drug, were noted in 12 cases; all were mild and readily reversible. Therapy was discontinued in two cases because of skin rash, and in two others because of vomiting. No incidence of haemopoietic or renal toxicity was observed. A common problem with broad-spectrum antibacterials is monilial overgrowth; this was not seen during the trial. All *Esch. coli*, isolated in the study, were sensitive to septrin, and no resistance organisms emerged as a result of the intermittent therapy.

Peritoneal Dialysis Solutions

GAULT, M. H. (*Canadian Med. Ass. J.*, **108**: 325, 1973) from the Department of Medicine, Queen Mary Veterans Hospital, Montreal, P.Q., writes:

Certain preventable complications in the treatment of renal failure, in part related to the composition of commercially prepared peritoneal dialysis solutions, continue to occur.

Solutions are advocated which would contain sodium 132, calcium 3·5, magnesium 1·5, chloride 102 and lactate or acetate 35 mEq./litre, and dextrose 1·5 per cent or about 4·25 per cent. Elimination of 7 per cent dextrose solutions and a reduction of the sodium and lactate concentrations should reduce complications due to hypovolaemia, hyperglycaemia, hypernatraemia and alkalosis. Reduction in the number of solutions should simplify the procedure and perhaps reduce costs. It is anticipated that some of the changes discussed will soon be introduced by indutry.

Treatment for Cerebral Concussion

RELANDER, M., TROUPP, H. AND BJORKLSTEN, G. AF. (*Brit. Med. J.*, **4**: 777, 1972) from Neurosurgical Clinic, Helsinki University Central Hospital, Helsinki, Finland, comment:

In a study designed to compare two types of treatment of cerebral concussion. 178 patients were allocated to a routine treatment or to an active treatment group; in the latter a good prognosis was emphasised, the patient was mobilised early and given physiotherapy. In the routine treatment group the average time off work was 32 days compared with 18 days in the active treatment group. Physiotherapy seemed to be particularly valuable in old patients and in those with exaggerated fears about their condition. It is suggested that throughout their illness and follow-up, patients with cerebral concussion should be under the care of one doctor, one who is particularly interested in the subject and that more propaganda is needed among hospital staff that concussion is not necessarily a dangerous condition.

Retinal Strokes

KOLLARITS, C. R., LUBOW, M. AND HISSONG, S. L. (*J. Amer. Med. Ass.*, **222**: 1273, 1972) from the Depart- of Ophthalmology, Division of Neurology and Department of Radiology, Ohio State University Hospitals, Columbus, state:

Seventy patients with retinal strokes were seen from August 1969 to March 1972. Fifty-three of these patients had a clinical picture suggestive of retinal artery occlusion due to emboli from atheromatous disease of the carotid bifurcation. Carotid arteriograms were performed in 45 of these patients. Carotid bifurcation atheromata were demonstrated as the probable source of emboli in 43 of the 45 patients (96 per cent).

Review of a series of 100 consecutive carotid arteriograms performed in hospital patients 60 years of age or older demonstrated an overall incidence of similar carotid atheromatous disease in only 24 per cent. The striking incidence of carotid lesions in patients with retinal stroke syndromes suggests that most retinal strokes are caused by embolisation from carotid bifurcation atheromata.

Carotid atheromata can be found in the majority of retinal stroke patients, especially those who have no clinical evidence of cardiac embolic disease. These patients may be subject to other retinal or cerebral stroke episodes or both within four to five years of their first eye symptoms.

Patients with retinal stroke whose history is compatible with embolisation from atheromatous vascular disease can be identified easily by critical carotid arteriography. Carotid surgery may prevent progressive ocular and cerebral vascular occlusive disease in these patients.

Visual Disturbances After Missile Head Injuries

ADELOYE, A. (*Brit. J. Ophthal.*, **56**: 905, 1972) from Neurosurgery Unit, University of Ibadan, Nigeria, West Africa, observes:

Disturbances of vision after head injury, both in war and in peace, have been recognised for a long time; they were observed after gunshot wounds of the head during the Russo-Japanese war, the first world war, and the second world war. At University College Hospital, Ibadan, Nigeria, we dealt with 250 patients with missile head wounds during the Nigerian civil war; 31 of these patients (28 soldiers and 3 civilians) developed disturbrances of vision and a brief analysis of the visual lesions encountered forms the subject of this paper.

As far as is known, the 31 patients with visual disturbance had had normal vision before being injured. They were all assessed clinically and treated subsequently at the neurosurgical and opthalmological units. Fifteen were lost to follow-up as a result of troop movements during and after the war and sixteen were followed up for from 1 month to 3 years.

Visual disturbances were found in 31 Nigerians after missile head injuries. Visual loss from anatomical damage to the visual pathway predominated. The loss was permanent in peripheral lesions, but a reasonably good recovery was seen in lesions of the optic radiation and visual cortex.

Reversible Toxic Psychosis After Cephalexin

SAKER, B. M., MUSK, A. W., HAYWOOD, E. F. AND HURST, P. E. (*Med. J. Aust.*, 1: 497, 1973) from the Department of Medicine, Royal Perth Hospital, Perth, W.A. 6001, write:

Cephalexin is a new semisynthetic derivative of cephalosporin C, which has the property of being well absorbed from the gastro-intestinal tract when administered orally. It has a broad range of antibacterial activity and has been used successfully in treating bacterial endocarditis.

Clinical studies have shown that the drug is removed from circulation almost entirely by the kidney. Prolongation of serum activity has been demonstrated in patients with impaired renal function.

Side effects have been remarkably mild and mainly consist of gastro-intestinal upsets, skin rashes and monilial vaginitis.

We report here the case of a patient with moderately severe uraemia with suspected bacterial endocarditis, who developed convulsions and a toxic confusional state after administration of cephalexin.

CURRENT TOPICS

1

Testing Penicillin Allergy

SISIR K. MAJUMDAR*

Allergy means altered energy or in the words of Von Pirquet, it is "changed or altered reactivity". Allergy and hypersensitivity are synonymous; allergy is a qualitative change while hypersensitivity is a quantitative connotation. In the classical coinage of Cannon immunity is a manifestation of the wisdom of the body while loss of homoeostasis or allergy or hypersensitivity is the stupidity of the body. Hypersensitivity may be immediate or delayed type. Anaphylaxis is an immediate-type hypersensitivity.

Penicillin is the queen of antibiotics. But the small molecule has come to be the most frequent cause of anaphylaxis in man. Penicillin G is a hapten and lacks the chemical structure to effect covalent linkage with body proteins, thereby becoming a complete antigen which could evoke antibody synthesis in the body. The development of hypersensitivity is not due to the effect of unaltered penicillin but is induced by degradation products of the drug, diastereoisomeric N-(alpha-benzylpenicilloyl) groups, predominantly epsilon-N-(alpha-benzylpenicilloyl)-lysine (Levine and Ovary, 1961; Parkar, 1963). This hapten combines with body proteins to form complete antigen which causes immunologic provocation. Cross-allergenicity is thought to occur because all penicillins are derivatives of 6-amino penicillanic acid and so produce similar metabolites after biotransformation within the endoplasmic reticulum of the liver by microsomal enzymes.

The performance of skin testing with penicillin itself is fraught with the danger of provoking a severe or even fatal reaction as anaphylactic shock. Penicilloyl-polylysine has been clinically applied to detect the preasence of hypersensitivity to penicillin (Parker and Thiel, 1963). With this diagnostic agent 35 per cent of individuals known to be sensitive to penicillin showed a positive skin reaction, and 6·8 per cent of non-allergic persons had positive tests (Rytel *et al.*, 1963). Presence of an important degree of hypersensitivity to penicillin can also be determined by skin scratch or conjunctival test with a small quantity of the drug. It has been proposed that penicillin—allergy may be detected by demonstrating degranulation of rabbit basophils exposed to a mixture of penicillin and serum from patients hypersensitive to the drug (Katz *et al.*, 1964).

As the years rolled on, a host of other tests were evolved to swell up the domain of methodology.

Leucocytes of ragweed-sensitive human donors when reacts with a purified pollen antigen release histamine which occurs as a response of sensitive cells to a specific allergenic stimulus. The use of human leucocytes, rather than animal cells is significant in view of the known species variations regarding the site of storage, the nature, quantity and tissue reactivity to those vasoactive autocoids whose production by the antigen-antibody reaction heralds the anaphylactic process; released histamine can be assayed quickly by spectrophotofluorometric method (Lawrence and Abraham, 1964).

Complete safety cannot be ensured by any single test at present available. A scheme of tests has been suggested (Assem and Schild, 1968):

(a) Passive sensitisation of human lung for detection of serum reagins—positive reaction does not require any further test.

(b) *In vitro* challenge of the patient's own leucocytes with penicillin, penicilloyl-polylysine and other antigens and then bio-assay of the histamine released in the process. But it is a time-consuming process.

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(c) Direct skin testing when the response is negative to the above set of tests.

If all these tests are negative, subjects are unlikely to develop any hypersensitivity to penicillin. Practical drawback in this scheme is the non-availability of human lung and much less sensitivity of monkey lung to histamine than human lung.

The *in vitro* radio-allergosorbent test, has been evolved to detect allergen—specific antibodies of a new immunoglobulin class, provisionally called Ig ND; antibodies to 14 different antigens were detected in the sera of hypersensitive subjects. A 96 per cent agreement was obtained between results from provocation tests and the *in vitro* test for hypersensitivity. This test might offer an important clue for the clinical diagnosis of hypersensitivity to various allergens (Wide *et al.*, 1967).

The diagnostic utility of skin testing before parenteral administration of penicillins with the reagents available today is another controversial matter. Skin testing with penicilloyl-polylysine is positive in many patients who then exihibit no hypersensitivity reaction to penicillins and sometimes negative in persons who respond anaphylactically (Macgregor *et al.*, 1971). In order to eliminate false-negative reactions, other test materials like penicillin G or some of its metabolites can also be used. But caution needs to be taken as these test materials may provocate different degrees of hypersensitisation including even anaphylactic shock in sensitised individuals (Macgregor *et al.*, *loc. cit.*).

It needs to be mentioned that skin testing with penicillin is dangerous in patients with a history of anaphylaxis. Of course other newer *in vitro* tests including histamine release from leucocytes (Lawrence and Abraham, *loc. cit.*), the use of passively sensitised lung tissue (Assem and Schild, *loc. cit.*), and the radio-allergosorbent test (Wide *et al.*, *loc. cit.*) would be valuable in establishing the diagnosis of penicillin allergy. The point needs stressing that a simplified bedside test is long overdue for day-to-day clinical practice; the techniques available at present are best suited for research purpose. It can be reasonably expected in the present spate of advancement in medical sciences that ripples of refinement will fast spread to this uncrossed frontier in diagnostic medicine. Prophylaxis will no longer pose a problem in therapy.

Hypersensitivity to penicillin is considered to be the most common cause of allergic reactions (1 to over 10 per cent) produced by drugs today (Feinberg, 1961). Factors predisposing individuals to sensitivity are still not fully known (Van aradel, 1965). Immunogenetical predisposition and pharmacogenetical aberration (so far steps of biotransformation leading to the formation of antigenic determinant is concerned) need to be critically studied. A suitable antigenic analogue—penicilloyl-polylysine has been synthesised to test an individual's state of hypersensitivity without itself sensitising or producing a hypersensitivity reaction (Parker *et al.*, 1962). A preparation containing, on average, 20 lysine groups per molecule, bearing 12 to 15 penicilloyl groups, has been found to be the most suitable (Deweck, 1963). But very few hospitals in the world have stock of this test substance. There is little danger of death resulting from the most acute manifestation, anaphylaxis, provided proper precautions are taken; nevertheless irreversible residual brain damage caused by secondary cerebral anoxia is a hazard that makes emergency therapy mandatory (Cohen, 1963).

Environmental and hereditary factors might play a significant role in the causation of drug allergy; intensive research is needed to unfold the various mechanisms involved in the production of hypersensitivity (West, 1967). Prediction of drug response in man is certainly the yardstick of the attainment of perfection in the clinico-diagnostic sphere of medical sciences.

Phobia pervades the medical profession regarding the anaphylactic action due to penicillin; this reaction is really rare but has been tremendously and irrationally exaggerated by the lay-press and also on the floor of national parliament in this country. If probably occurs in 1 out of 100 or so but for that unfortunate and unpredictable one in a doctor's chamber, the prestige, prosperity and even the physical existence of the doctor might be the first casualty for no fault of his. It is true that this reaction—mild or severe is not likely to occur on first administration in patients who have not tasted penicillins in any form or fashion before but can occur on any subsequent administration if sufficient circulating antibody is available in the blood. However, it is advisable to keep the emergency drugs ready at hand whenever penicillin, vaccines or any other allergenic drugs is administered parenterally. Mass education through popular press, radio, etc., and adequate enlightenment of the profession in this matter are some of the steps which are worth-taking. Wrong notions about penicillin allergy need to be eradicated from both popular and medical minds otherwise a really needy patient may be deprived of the benefit of such a novel antibiotic.

The era of antibiotic therapy began with the introduction of penicillins in 1940; though newer semi-synthetic penicillins are not immune from inherent antigenicity, penicillins with its merits and demerits is stil the leader of antibiotic orchestra. Except rare anaphylactic reaction penicillins do not have any other serious toxicity. A product of the bed-pans at Oxford is still beaming in its reflected glory and it is not an illusion to aspire that penicillin will exist triumphantly so long civilisation exists.

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2

Training of Orthopaedic Surgeons

SATYA PRAKASH KAUSHAL*

The tremendous increase of medical knowledge has made us retreat into many facets of it, to specialise with limited scope and objectives. Scott (1950) said "- —-- that this trend represents the progress of our times is undesirable- —— —". However, this trend in graduate surgical education in an unqualified manner may lead to a ridiculous degree of over specialisation of interests with extremely narrow perspectives and premature acquisition of skills on a trade school basis. In other words, specialisation from an early stage without fundamental training in principles of surgery will beget narrow perspective technocrats rather than "doctors".

The facilities available and vacancies present in our current medical care set up leaves much to be desired. Existing posts for "orthopaedic surgeons" in our zone of the country (Himachal, Punjab, Haryana and Chandigarh) outside the teaching institutes are only two viz., at Saket Hospital Chandi Mandir. No provincial or district hospitals have any post for orthopaedic surgeons. As alternatives of joining the armed forces, railways are there. The army does not recognise the training period for promotions, etc., and the antedate given in lieu of this period does not make up at par with our colleagues who joined the forces after M.B.B.S. and moreover the postgraduates do not get specialists' post in that organisation. Railways have a few vacancies, but for the last so many years none has been advertised, presumably they have already been filled. Expansion of existing departments in the teaching hospitals is neither economically feasible nor is in the interest of the general public as in this way the desired object of serving our scattered population as a whole is not fulfilled. The door to emigration is being closed slowly by our government as well as other countries, this escape route is being closed with the pretext of keeping the "talent" at home. Applications for the provincial posts are already oversubscribed and even if one is lucky to get such an appointment he will have to do much more than pure orthopaedics at such hospitals i.e., emergency surgery of all types, administration, family planning and public health work. Our training does not equip the candidates for any of these works.

Under these circumstances, is it worthwhile to mass produce orthopaedic surgeons or for that reason any other "pure" specialists? This is a trap, which one hopes, our overambitious planners do not fall into. Much can be said for closer integration and overall training before specialisation. "Early specialisotion has harmed sound surgical practice and has, perhaps, weakened the whole structure of surgery".

I hope, I am not being misunderstood. I recognise the need for specialists in our country. In any good medical set up, orthopaedics has been recognised as a speciality for a long time and traumatology is now being recognised as a science in its own right. In the past, these two have been considered as poor sisters of surgery in many centres. In quite a few, anybody is willing to have a go at playing the "bone setter." The courage of the "practitioners", "pahalwans" and "malishwallas" supplies us with a continuous stream of mishandled cases. Increase in longevity, interests in sports, motorised transportation and industrialisation are creating a demand for qualified orthopaedic surgeons all over the country. We don't have enough orthopaedic urgeon even to fulfil the need for rehabilitation of the disabled. Needless to say that the need for the specialists is there, but my plea is that we should give a broad base to their training. The profession, as a whole, should try to convince the authorities for the urgent need of providing facilities for specialists at least at district level. We should also try to mobilise public opinion for the same purpose.

Suggested changes—The training of surgical specialists should be preceded or accompanied by training in principles of "general surgery". The period of internship and house jobs should cover only limited amount of 'speciality' postings. The majority of this period should be spent in acquiring proficiency in general principles. The basic training should be arranged in such a way that residents aiming to specialise should work in complimentary sections for most of their training period, i.e., a future orthopaedic surgeon should also work in traumatology, plastic surgery, neurosurgery and vascular surgery; an aspirant to genitourinary surgery should also work in general surgery, plastic surgery and gynaecology. Everyone should have some experience in emergency surgery of all types, irrespective of what specialisation they are attempting. All surgeons should be trained so that they can safely tackle "universal operations" viz., appendicectomy, suprapubic cystostomy, strangulated hernias, fractures, osteomyelitis, etc.

Most of the teaching should be in the form of discussion groups, tutorials, practical training and minimal formal lectures.

This programme should be under constant review and changes should be made from time to time according to the changing patterns of society, available man power and facilities. The body which decides the pattern of training should include representatives of the employers, educationists and the students.

SUMMARY

Existing inadequacies in surgical speciality training are discussed, a plea is made to give a broad base to such

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training. It is suggested that authorities and employers should be approached to create specialist posts and facilities at district headquarter level.

ACKNOWLEDGMENT

Most of the material of this paper has been collected from discussion amongst my residents during informal dialouges, for this I sincerely thank them.

REFERENCE

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NOTES AND NEWS

Rs. 400 Crores for Rural Health Services in Fifth Plan

Addressing the parliamentary consultative committee of his ministry, Sri R. K. Khadilkar, Union Minister for Health and Family Planning, recently said that the Union Government had planned to spend Rs. 400 crores in the Fifth Plan on providing minimum health services in the rural areas. The emphasis would be on preventive medicine, family planning and nutrition and the main thrust would be to make good the deficiencies in the existing medical services at the primary centres and sub-centres. It was proposed to upgrade 1,500 primary health centres to 30-bed hospitals in backward areas, he said.

Rs. 200 Crore Scheme for Drug Industry

An investment of more than Rs. 200 crores by both the public and private sector is envisaged in the Fifth Plan to increase the current production of drugs and pharmaceuticals in the country.

The plan target is to increase the production of drugs and pharmaceuticals from the present Rs. 300 crores to Rs. 600 crores by 1978-79, according to official sources.

Sunflower Oil Helps Sclerosis Patients

A group of British doctors have discovered that the addition of oil from the sun-flower seed aids the treatment of multiple sclerosis. *British Medical Journal* has recently reported.

Doctors of the National Hospital for Nervous Diseases in London and the Royal Victoria Hospital in Belfast and Professor Ephrain Field of Newcastle University have established that people with the complaint lack linoleic acid in their body and sunflower seed oil has a large proportion of the acid.

Brain 'Dies' Much More Slowly than Supposed So Long

The gulf that separates life from death is at least one hour and a half wide, according to Professor Klaus Zulch, Director of the Max Planck Institute for Brain Research in Cologne.

A young Cologne physician Dr. Hossman's experiments with animals have now established that the brain "dies" much more slowly than has been supposed.

Earlier it was believed that the brain gets irreparably damaged as soon as the blood supply is cut off.

The Cologne researcher has shown that a stoppage in the supply of blood to the brain leads to a shrinkage of the blood vessels leading to and from the heart. Even when the circulation is restored the blood vessels remain contracted. Experiments conducted on animals have, however, shown that this condition can be corrected by raising the blood pressure.

For three years Dr. Hossmann carried out a series of tests, stopping the flow of blood to the brain of laboratory animals and then after an hour or so restoring the blood supply usually by raising the blood pressure. In at least two third of these tests, the animals retained their blood cells undamaged. Within three hours the recovery was complete.

Scopolamine To Be Made from *Dhatura*

Efforts are being made to produce scopolamine indigently at Jammu from *dhatura*, a wild growing plant, whose extract has for long been misused by anti-social elements in various parts of the world. Currently being produced in Eastern Europe, scopolamine is an extremely poisonous drug which is used in minute doses as medicine for various purposes like control of shell-shock in wars or of tremors in Parkinson's disease and also used in delirium and psychotic conditions, in violent spasms in asthma and whooping cough, etc.

According to Dr. C. K. Atal, chief of the regional research laboratory at Jammu, of the three species found in India, two namely *dhatura innoxia* and *dhatura metel*, are proposed to be used for the manufacture of scopolamine.

The proposed Jammu factory is to be commissioned in November, 1973.

Heart Valves from Cadaver Used in Transplant

A team of doctors at the Sassoon General Hospital led by by Dr. A. V. Kanetkar claims to have successfully carried out for the first time in India two heart valve transplant operations using valves from a cadaver.

The patients were a 14-year-old boy and a 27-year-old labourer, whose crippled mitral valves were replaced by the team. Operated on 1-7-73, they looked healthy and moved about freely on 8-7-73 when they were produced before the Poona newsmen by Dr. G. S. Mutalik, dean of the hospital.

This homograft technique, which used a decorn tube instead of a metal ring to support the mitral valve, involved a much more laborious process than in putting in an artificial valve, Dr. Mutalik explained. The latter, however, gave rise to clot formation requiring a constant intake of anticoagulant drugs by the patients after the operation, while the homograft valve did not need any care, he explained.

Dr. Kanetkar later told newsmen that this operation was seldom attempted, as it was laborious and bore down one's patience. He said that, as far as he knew, only Dr. M. H. Yacoub of Harefield Hospital (England) and Dr. C. F. Kittle of Chicago Hospital (USA) had success fully performed this type of operation.

CORRESPONDENCE

The Editor is not responsible for the views expressed by correspondents

Consulting Physician

SIR,--In his letter to the Editor (*J. Indian M. A.*, **60**: 183, 1973) Dr. Musthafa has probed some facts which have bearing on the attitudes we, in India, have inherited from the British hierarchical system. This legacy is reflected in our deep-rooted, though wrongly placed, emphasis on degrees (may I call them a "tail"?) after a name. The longer the tail, the greater the respect commanded. That is the conclusion I draw when I look at some of the listings in the green pages of the Delhi Telephone Directory under the category "Medical Practitioners".

The two questions raised by Dr. Musthafa have a simple answer. Yes, they are both worthy of calling themselves consultants. I agree with Dr. M. V. Chari (*J. Indian M. A.*, **60**: 449, 1973) that a doctor without a postgraduate degree or diploma can certainly practise as a consultant if adequately trained. On the other hand, a doctor with a long "tail" can certainly function as a general practitioner if he so chooses.

Let us examine the system prevalent in U.S.A. All doctors obtain the basic degree M.D., which is equivalent to our M.B.B.S. Beyond that hardly anyone goes in for further postgraduate degrees even though several universities offer programs leading to such postgraduate degrees. Of course, every specialist has gone through the necessary period of postgraduate training in his speciality. After finishing the training one may appear in the certifying examination offered by the American Board of that particular speciality. A person who is adequately trained is board-eligible, i.e., eligible for the certifying examination. A person who has passed the certifying examination is said to be board-certified. That they are both equally qualified to be specialists and to practise as consultants, no one doubts. Even academic jobs in universities do not require one to be board-certified. As long as one is adequately trained one is considered qualified. This is regardless of the fact whether one is board-certified or only board-eligible.

Dr. Musthafa cites Dr. Simonson. I was at the University of Minnesota for seven years and can vouch for the fact although Dr. Simonson does not have a postgraduate degree in cardiology, he is one of the world's leading electrocardiographers and vectrocardiographers. I think Dr. Francisco Grande, basically trained as a physiologist, presents an even more illuminating example. Dr. Grande simultaneously holds three full professorial chairs at the University of Minnesota Medical School in the departments of physiology, nutrition and physiological hygiene!

At the other extreme we find ourselves here in India splitting hair—one may be adequately "trained" yet not properly "qualified" if one does have the right kind of "tail".

I am, etc.,

8/2, West Patelnagar,
New Delhi

SURENDRA SETHI, M.B.B.S.
M.S. (MEDICINE, U.S.A.),
F.C.C.P. (U.S.A.)

OBITUARIES

Dr. A. J. Dave

Death took place of Dr. Amritlal J. Dave on 4-6-73 following a heart attack.

Dr. Dave qualified as an L.C.P.S. at Nair Hospital, Bombay, in 1935 and joined the Western Railways as an Assistant Surgeon. During the tenure of his service he was posted at Rajpur, Mahara and Bhavnagar.

A man of kind disposition, Dr. Dave was loved by his colleagues, staff and patients alike. He retired from service in 1968 and started private practice at Bhavnagar.

Dr. Dave was a member of the Bhavnagar Branch of I.M.A. in Gujarat since its inception. He leaves behind two sons and four daughters.

DR. A. J. DAVE

Dr. Ravi Varma

Dr. Ravi Varma, an eminent physician of Allahabad, passed away on 14-6-73 at the age of 58.

Dr. Varma qualified as an L.S.M.F. from Agra Medical College in 1937 and obtained his diploma in tropical medicine from Calcutta School of Tropical Medicine the following year. He started his professional life by joining the then Rampur State Services as medical officer. In 1946 he came back to Allahabad and set up private practice at the Muthiganj area of the town in 1950.

DR. RAVI VARMA

Dr. Varma joined the Allahabad branch of I.M.A. shortly after his settling down in the city. He was an active member of the branch till the closing years of his life. He was a member of the executive body of the branch for the year 1967-68 and helped the branch in various ways in promoting its sports activities as Sports Secretary for several years. Himself a renowned tennis and cricket player of his time, he donated a running trophy to the branch for hloding an annual cricket match between a team of private medical practitioners and a team of government doctors.

Dr. Varma is survived by his wife, a daughter and three sons, two of them Dr. Arun Varma and Dr. Sunil Varma now serving at Bareilly and at Allahabad respectively.

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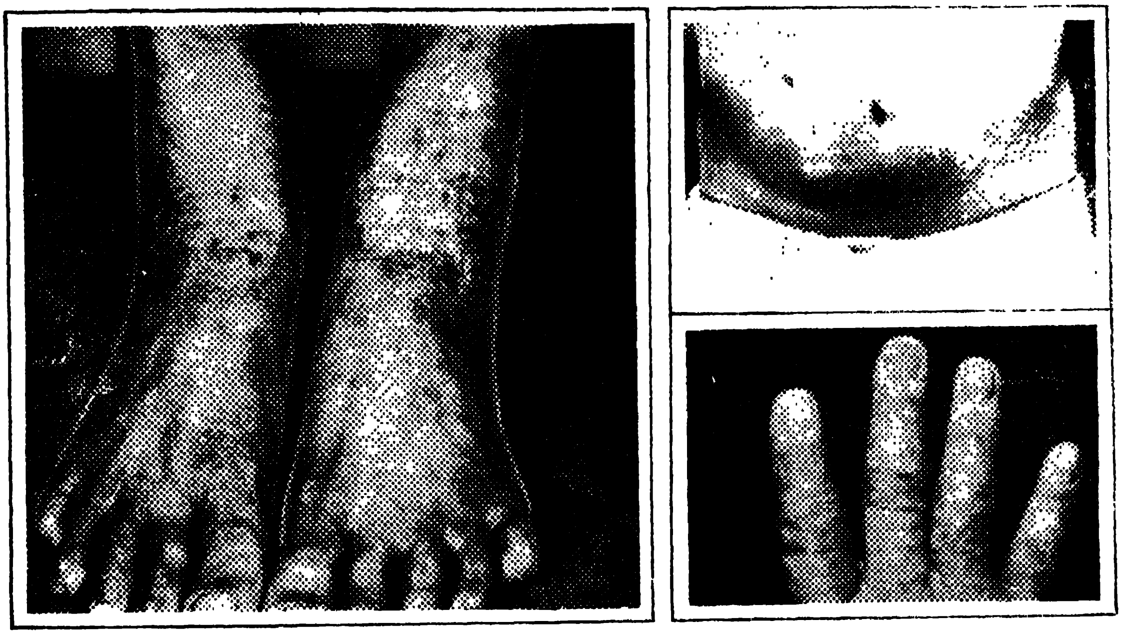

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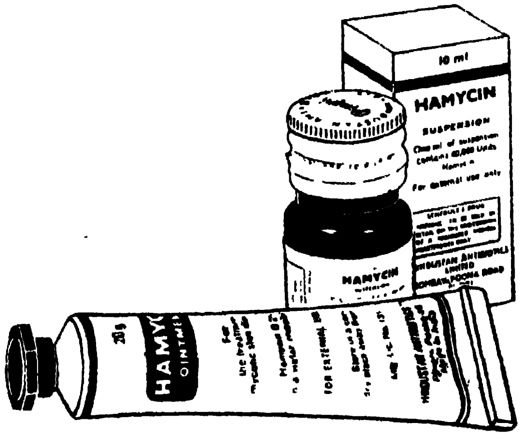

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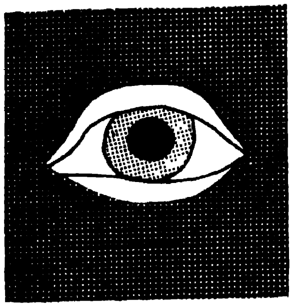

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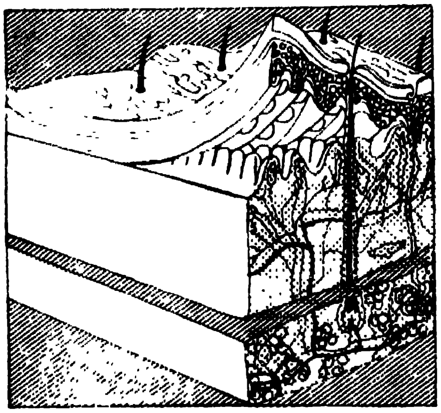

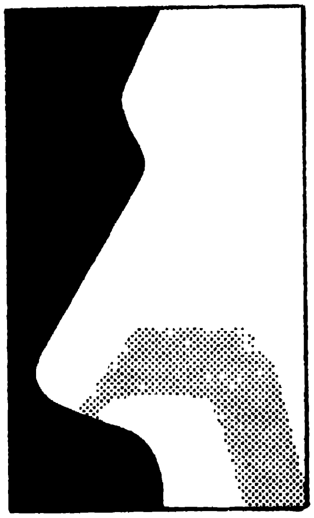

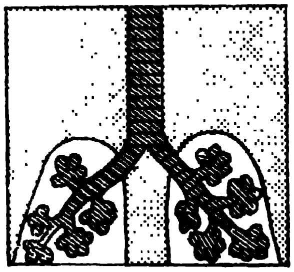

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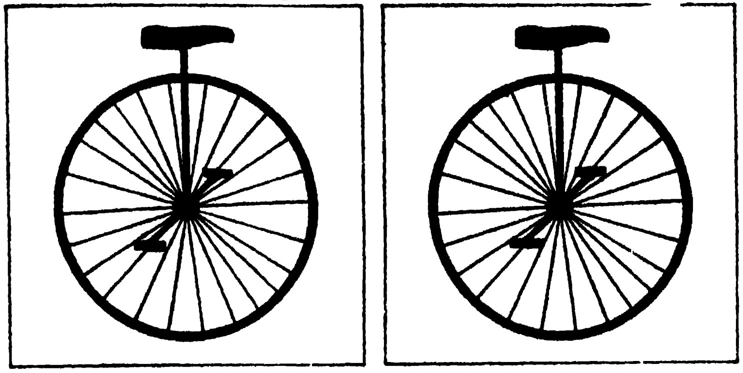

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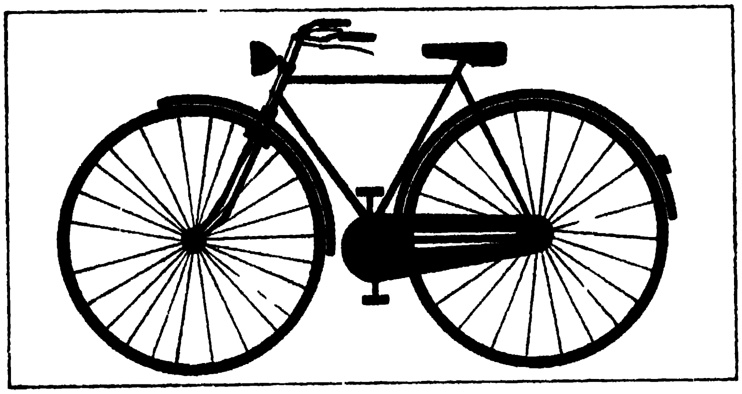

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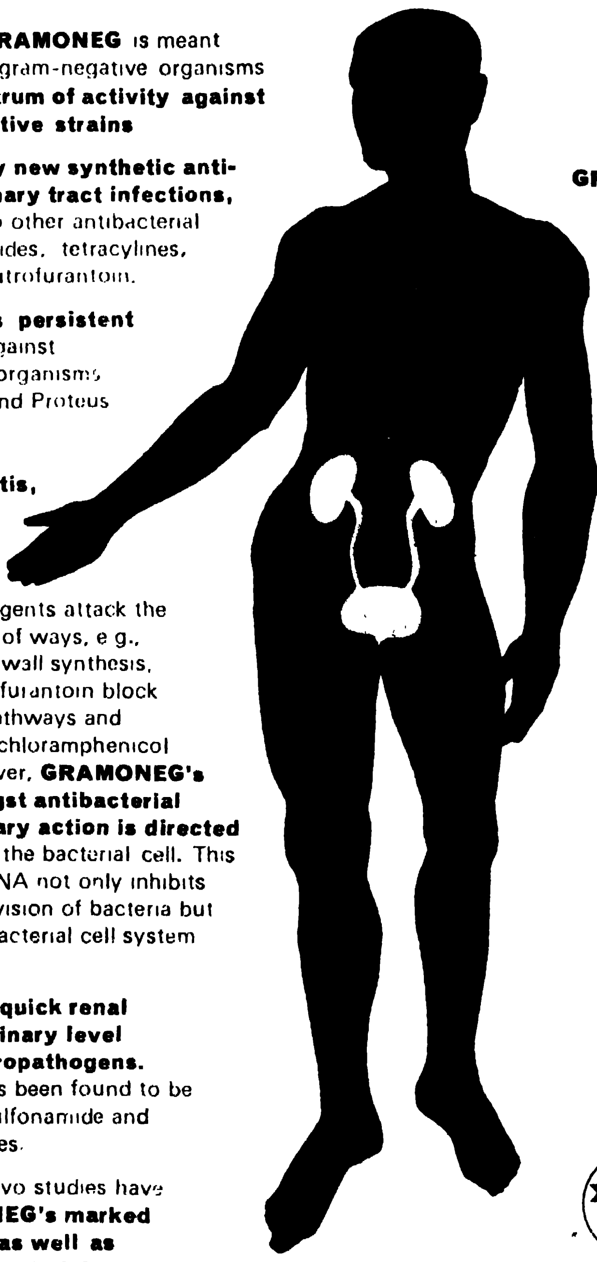

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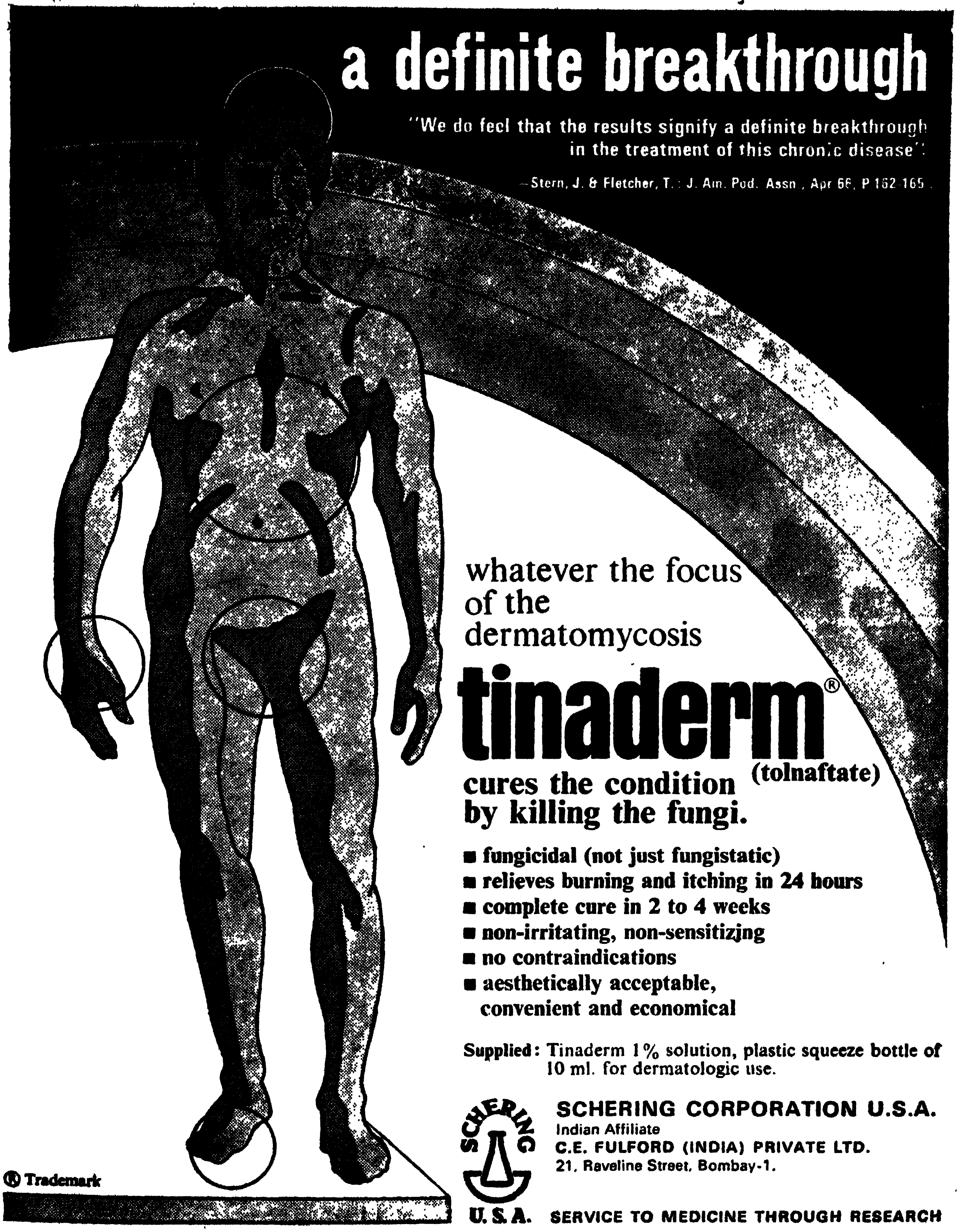

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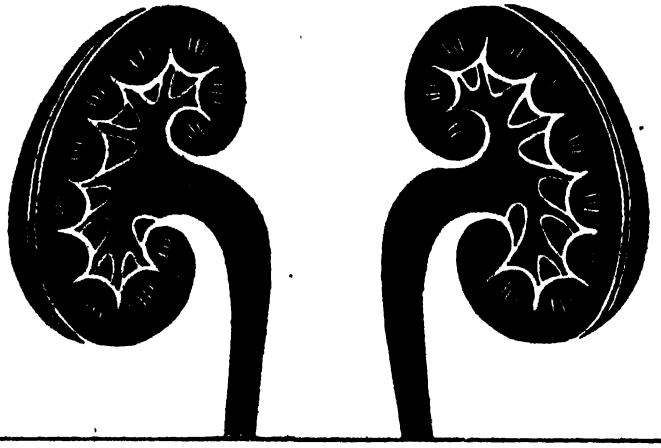

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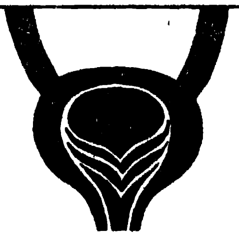

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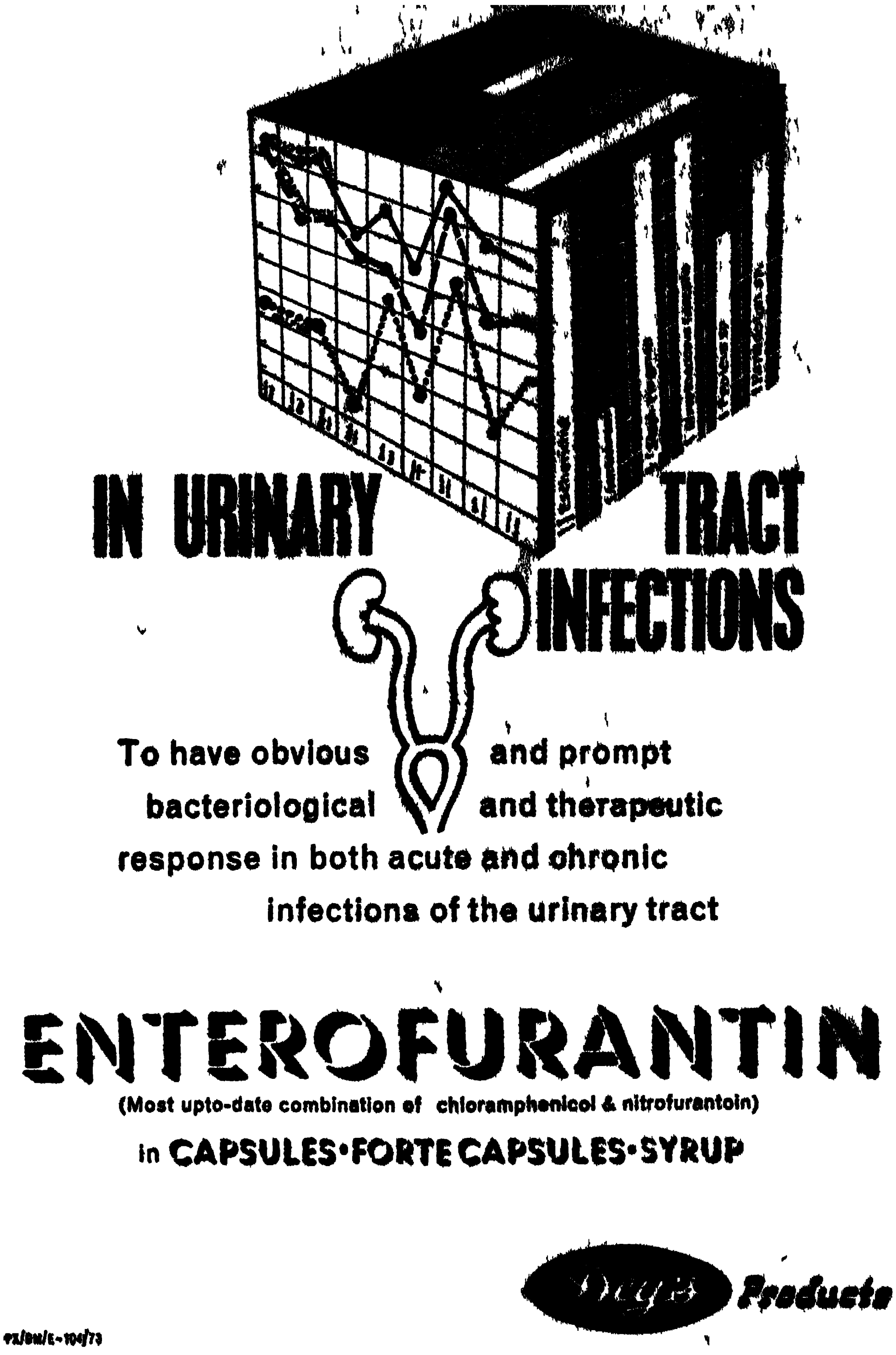

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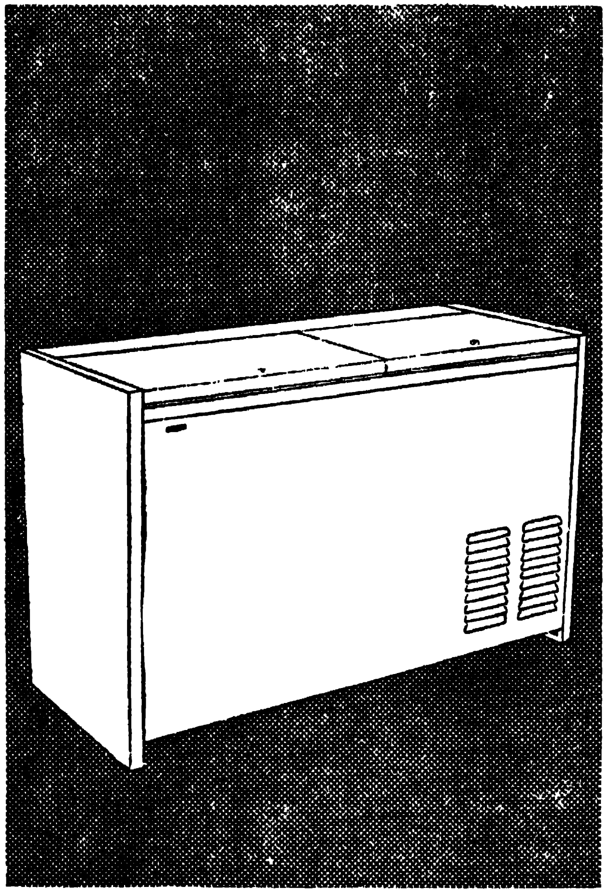

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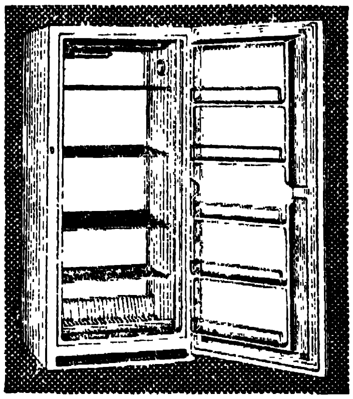

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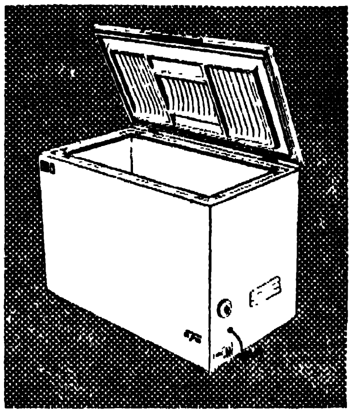

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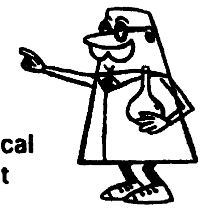

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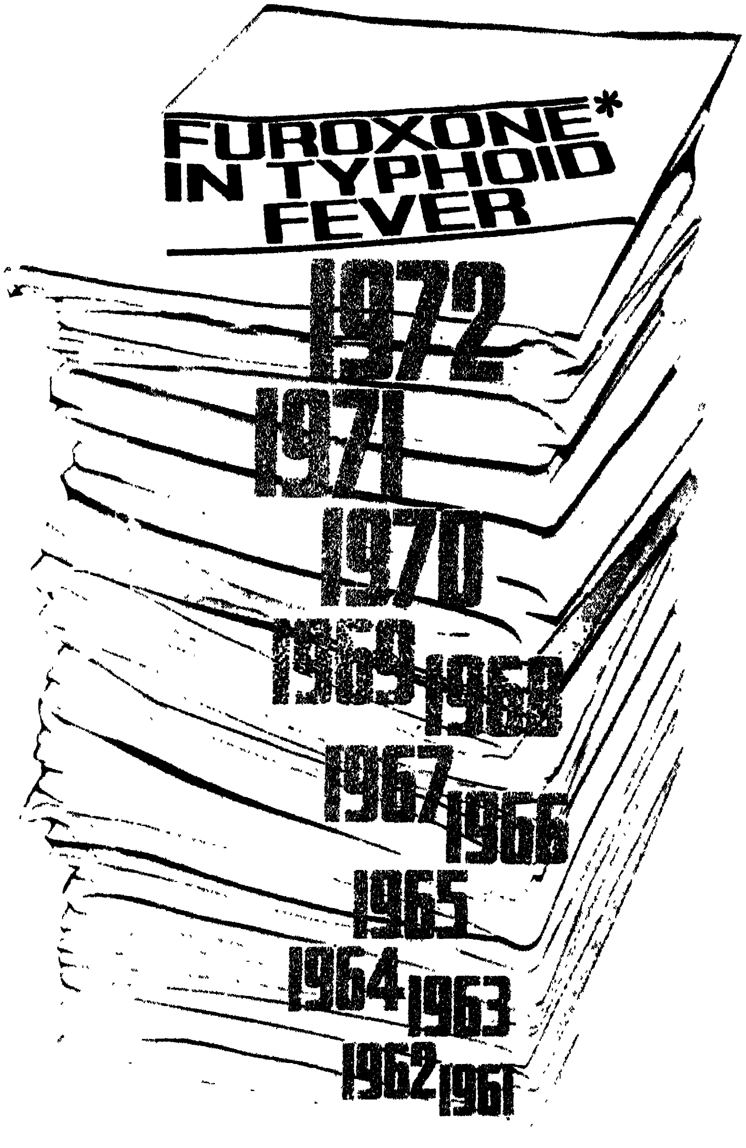

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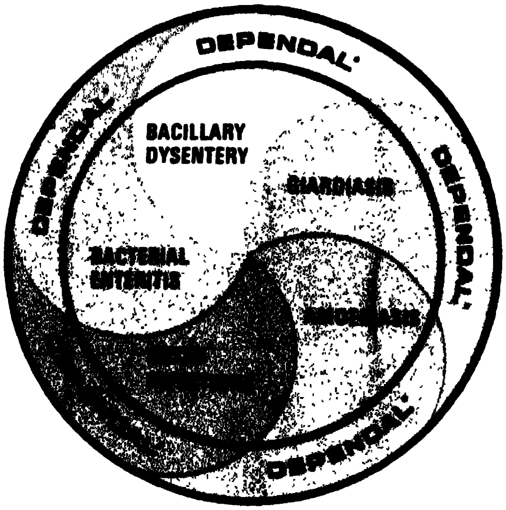

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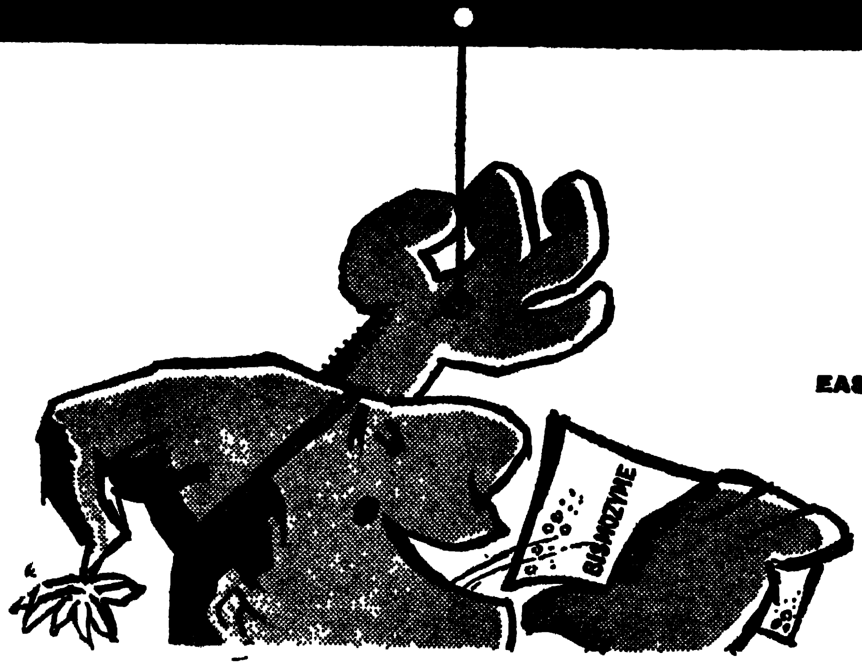

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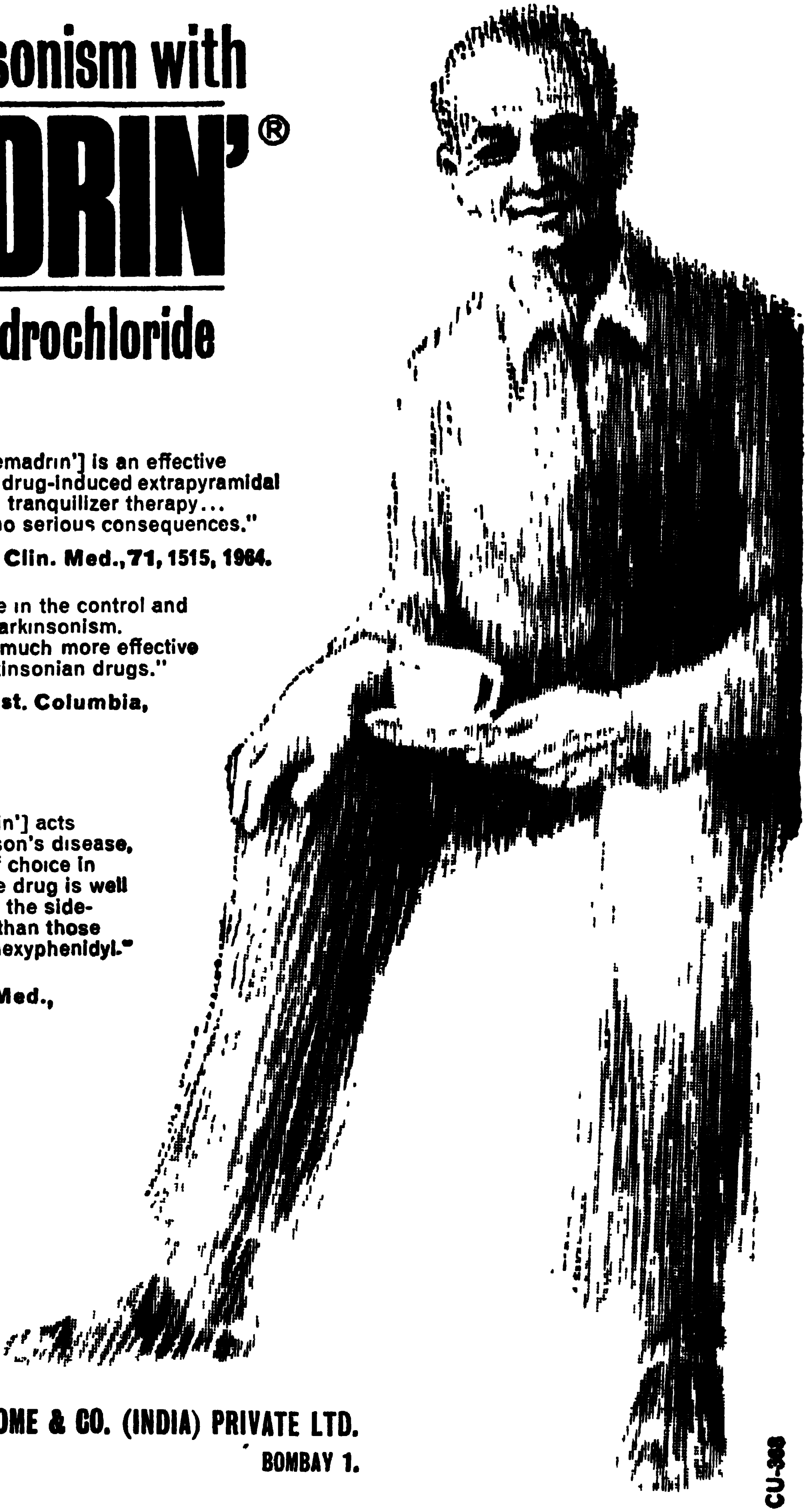

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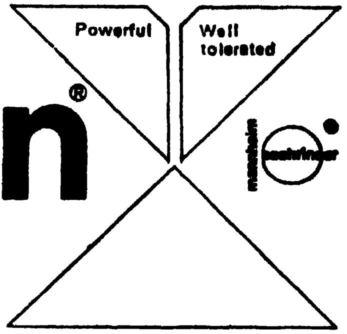

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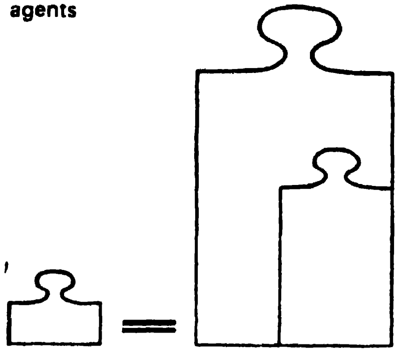

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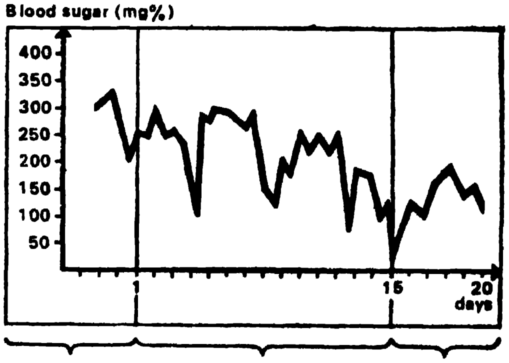

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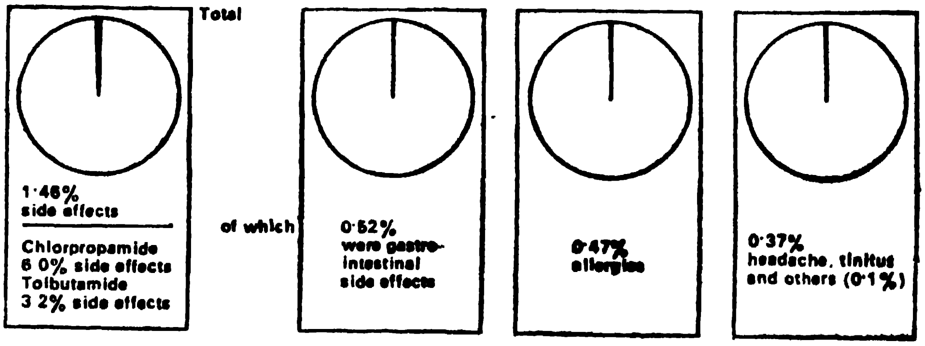

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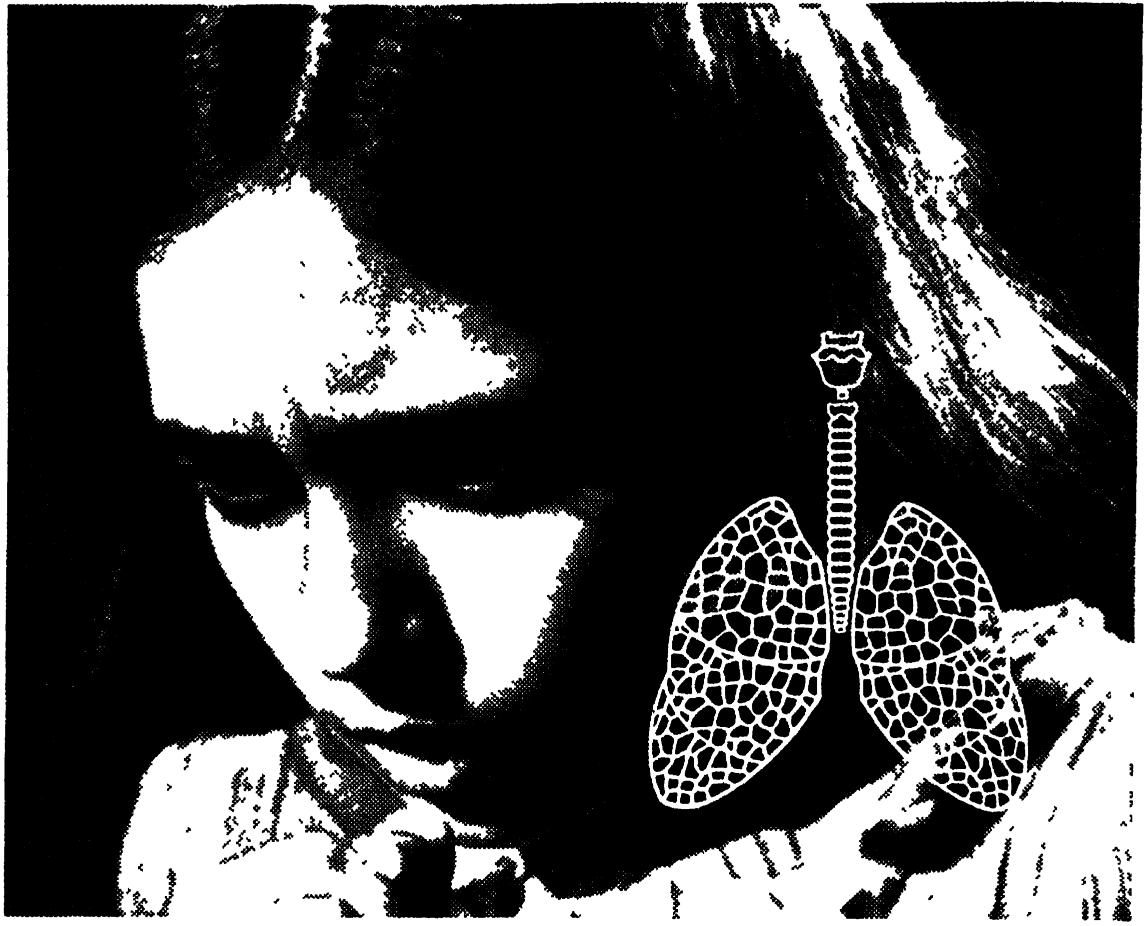

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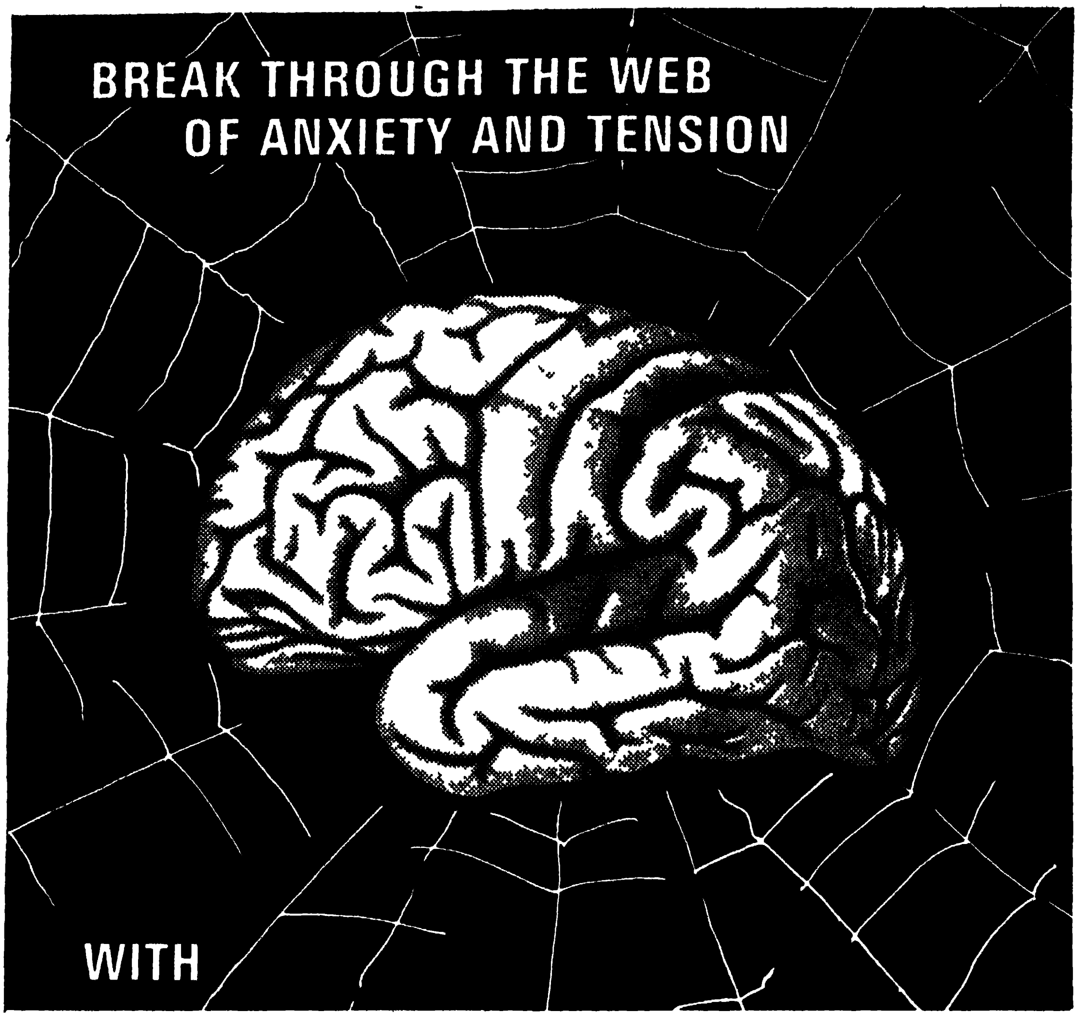

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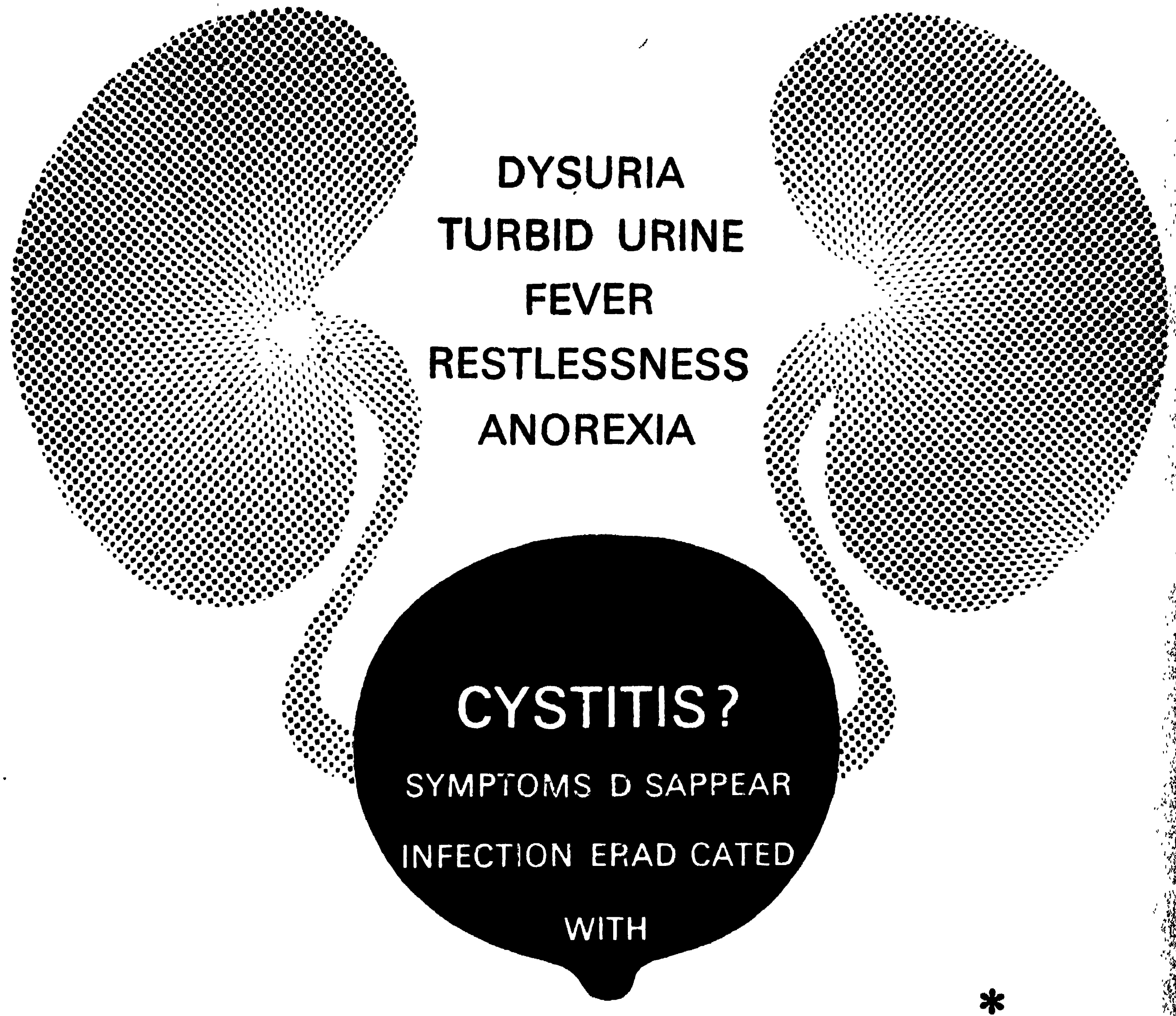

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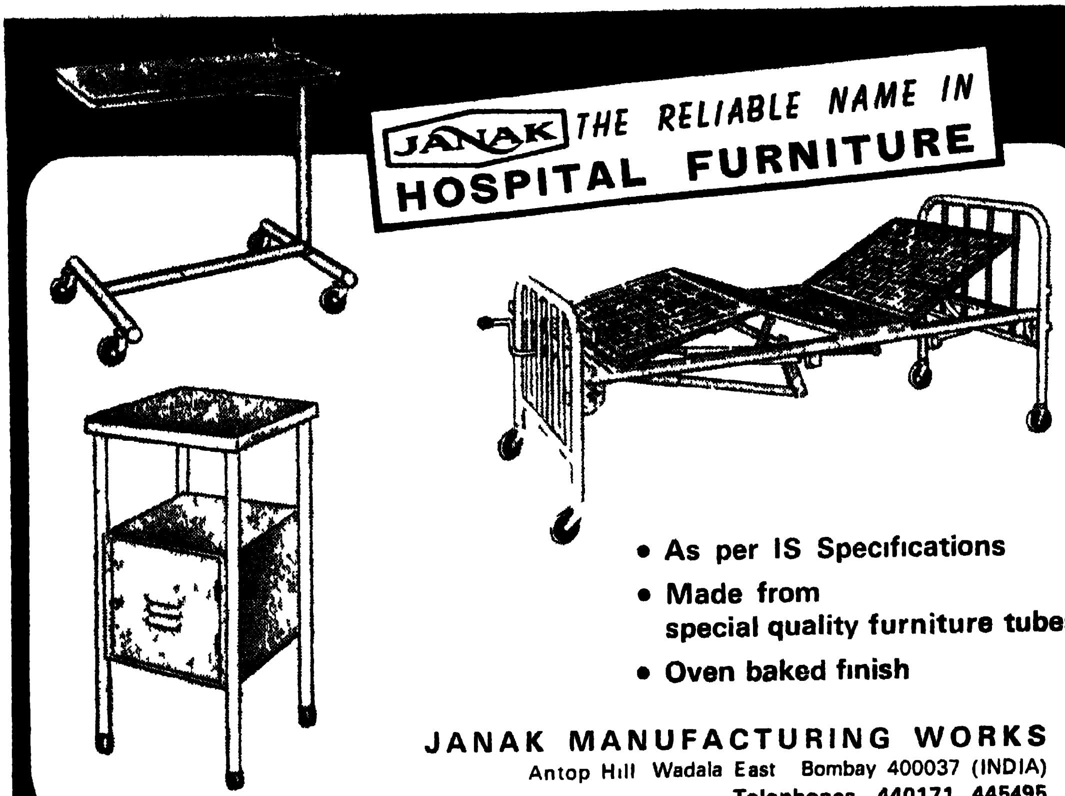

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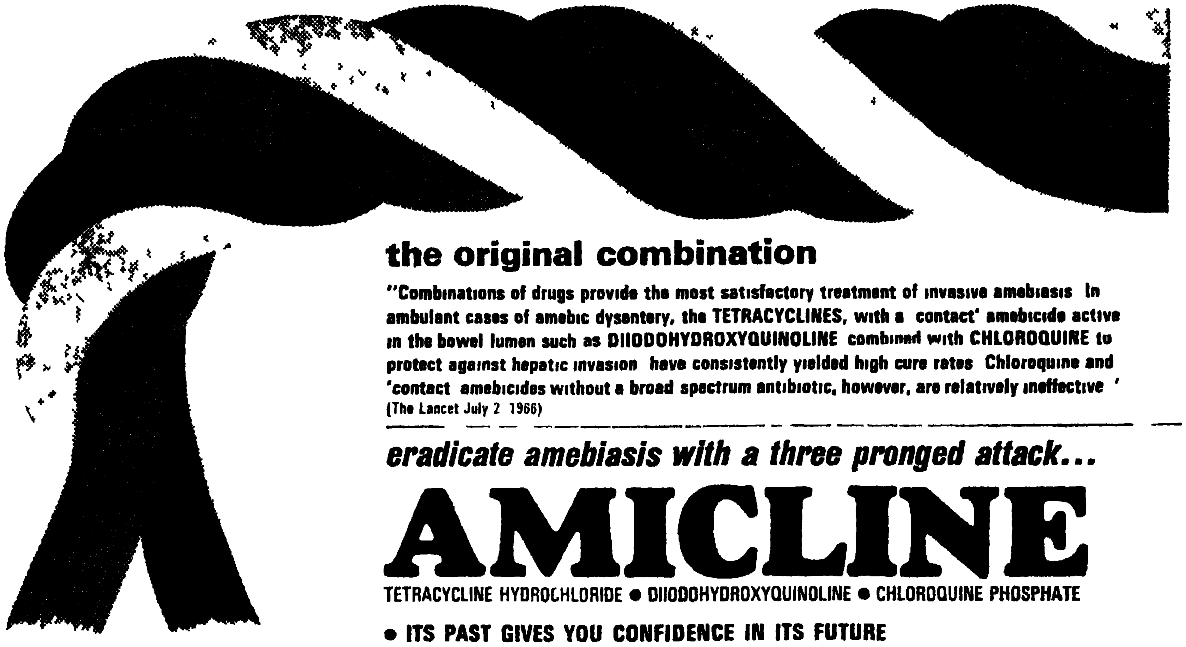

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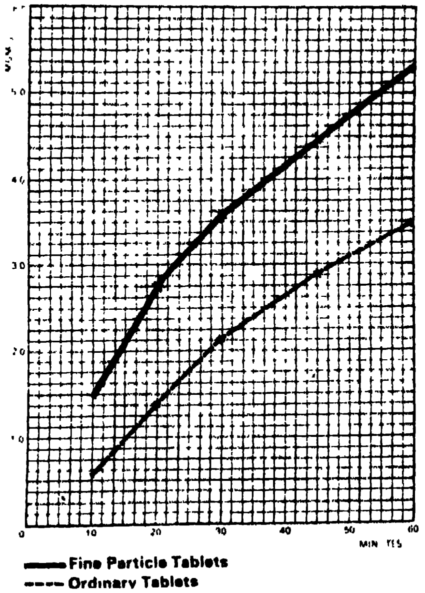

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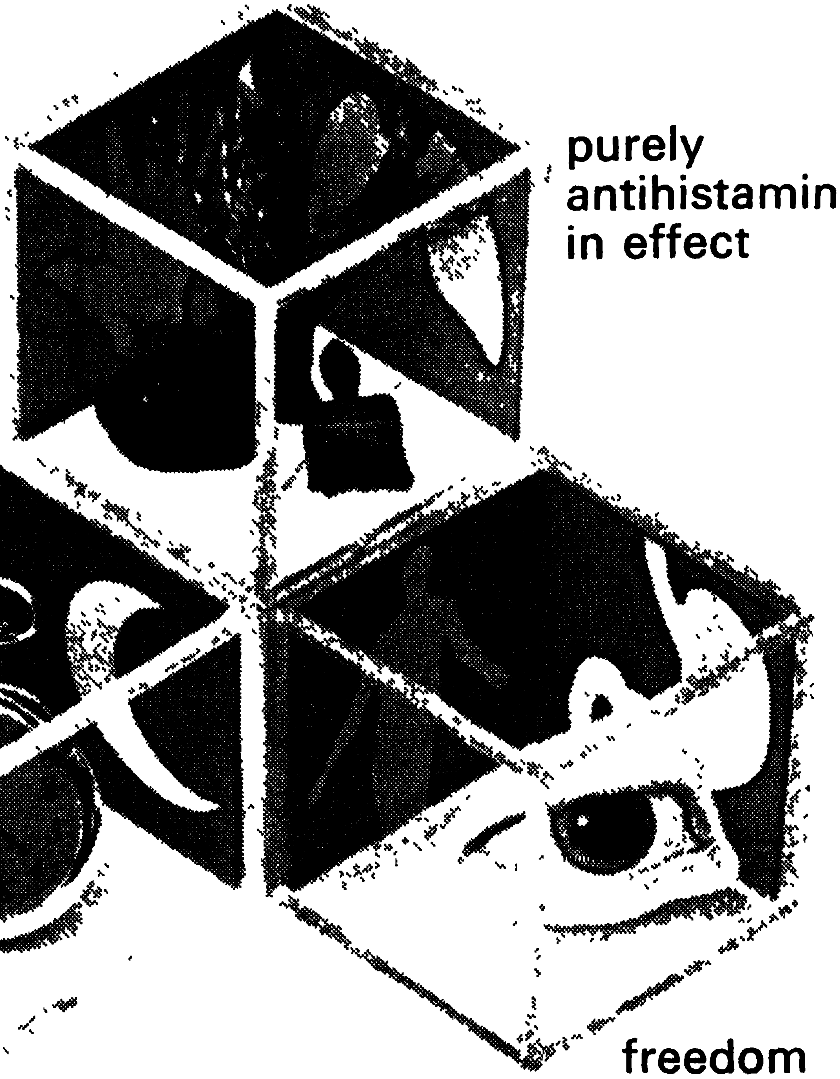

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AUGUST 16, 1973

ORIGINALS AND PAPERS

1

Clinical and Metabolic Profile in Diabetic Cardiovascular Disease

H. VAISHNAVA*, A. A. HAGROO**

[Received for publication July 3, 1973]

Cardiovascular and renal involvement in diabetes mellitus is mainly responsible for morbidity and mortality in the West. Even in this country, 40 to 56·7 per cent diabetics have been found to have one or more vascular complications as reported by various authors (Shah, 1965 ; Shah *et al.*, 1966 ; Mukerjee *et al.*, 1966 ; Urs, 1966 ; Banerjee, 1966) A comparatively low incidence of cardiovascular complications in such patients has been described in Yemenite Jews, Japanese, Jamaicans, South African Bantus, and Navajo Indians of the U.S.A. (Tulloch, 1962 ; Campbell, 1963 ; Gelfand and Forbes, 1963 ; Brunner *et al.*, 1964 ; Wada *et al.*, 1964 ; Saiki and Rimoni, 1968). In the tropics ketosis-resistant, insulin-dependent growth onset type of diabetes has been described in which the prevalence of cardiovascular complications is extremely low (DeZoysa, 1951 ; Tulloch, *loc. cit.* ; Vaishnava *et al.*, 1970). A relatively low prevalence of these complications has been reported in all Indian diabetics (Mitra and Chhetri, 1961 ; Pathania and Sachar, 1961 ; Urs, *loc. cit*, Vaishnava *et al.*, 1964 ; Vaishnava and Bhasin, 1969).

Vascular complications in diabetes mellitus have been described to be of two types : (1) Microangiopathy consisting of characteristic lesions in the small blood vessels ; (2) atherosclerotic lesions of the medium and large arteries (macroangiopathy).

DIABETIC MICROANGIOPATHY

This consists of intimal proliferation with thickening of the basement membrane and the presence of PAS-positive material in the small blood vessels. This type of vasculopathy is considered to be a characteristic feature of vascular disease in diabetes and is responsible for nephropathy, retinopathy, and possibly peripheral neuropathy and peripheral vascular calcification (Farguhar, 1959 ; Goldenberg *et al.*, 1959 ; Zacks *et al.*, 1962 ; Bloodworth, 1963). These changes are almost always absent in arteriosclerotic non-diabetic subjects (Ferrier, 1967).

Diabetic microangiopathy has been reported to vary between 46·3 to 73·9 per cent in the small vessels of the skin and muscles (Vaishnava *et al.*, 1967 ; Venkateshwar and Bhasin, 1969 ; Chhetri *et al.*, 1970). Goldenberg *et al.* (*loc. cit.*) and Pederson and Olsen (1962) reported it in 62 per cent of Western patients. These authors have not reported any positive correlation of microangiopathy of leg vessels with retinopathy and nephropathy and arteriosclerosis of larger arteries. Siperstein *et al.* (1968) found that 53·3 per cent of 30 genetically prediabetic subjects have microangiopathic changes in muscular capillaries. Yodaiken *et al.* (1969) also

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Department of Medicine, Maulana Azad Medical College and Associated Hospitals, New Delhi

* M.D., F.R.C.P., Professor and Head of the Department

** M.D., Registrar

found a significant basement membrane thickening in the prediabetics and controls. They suggested that this finding could be a significant indication of prediabetes. Bhu *et al.* (1966) reported small blood vessel changes in 65 per cent subjects with chemical diabetes.

A positive correlation of the microangiopathy with the chronological age was seen, as all diabetics above 50 years of age showed it (Vaishnava *et al.*, 1966 ; Pederson and Olsen, *loc. cit.*). Aagenaes and Moe (1961) and Bercovici *et al.* (1964) noted pronounced changes in those who developed diabetes before the age of 40 years. Many workers have shown a total absence of correlation between the microangiopathy, and the duration, severity and the degree of control of diabetes (Zacks *et al., loc. cit.* : Pederson and Olsen, *loc. cit.* ; Vaishnava *et al.*, 1966 ; Siperstein *et al.*, 1970). But Foa (1971) observed a significant correlation between the duration of carbohydrate intolerance and the incidence and the degree of basement membrane thickening.

Despite uncertainty, as to the occurrence of change in the walls of the small vessels or in metabolites circulating through them prior to the onset of diabetes, the following possible concepts are evident: (1) The changes are produced by an underlying vascular disturbance which is genetically inherited with diabetes, their progression being completely or partially preventable by adequate insulin ; (2) the changes result from disturbed metabolism which can be controlled with insulin therapy; (3) a common abnormality, that is an auto-immune response to insulin or a precursor—is inherited and is responsible for both the disturbed metabolism and the vascular disease ; or (4) the metabolic and vascular components are inherited as separate abnormalities and run their course independently (Bradley, 1971). Siperstein *et al.* (1970) concluded that microangiopathy may be an independent consequence of the primary genetic lesion in diabetes or may represent the primary lesion, or even be an independent genetic lesion by itself. Vaishnava *et al.* (1966) pointed out that the metabolic changes of diabetes do not seem to run parallel with the changes in small blood vessels, but both these features may be the different facets of the same fundamental disorder.

Factors responsible to produce microangiopathy are: (a) Impairment of circulatory flow in the terminal vessels leading to prolonged hypoxia and undernutrition of the endothelium. It also leads to neovascularisation in diabetic retinopathy (Ashton, 1963 ; Ditzel, 1968) ; (b) a metabolic disorder of simple polysaccharides (glycogen) or complex polysaccharides (mucopolysaccharides) or both, involving basement membranes of capillaries and ground substance of connective tissue (Ditzel, *loc. cit.*). Various metabolic abnormalities seen in microangiopathy are as follows: 1. Serum proteins: Lowered albumin values with increase in alpha-2 and beta globulins have been demonstrated in association with nephropathy especially in Kimmelstiel-Wilson syndrome (Schneider *et al.*, 1946 ; Ejarque *et al.*, 1959 ; Winzler, 1964). Increase in gamma globulin levels has been observed when the duration of the disease was more than 5 years (Sikka *et al.*, 1968 ; Biswakumar and Singh, 1969). 2. Protein-bound carbohydrates (mucopolysaccharides, glycoproteins and glycolipids): Elevation of mucoprotein fraction and glycoprotein has been repeatedly found in diabetics (Winzler, *loc. cit.*). The marked increase of protein-bound carbohydrate in diabetic nephropathy is predominantly seen in alpha-1 and alpha-2 protein fractions. Main features in the behaviour of these substances in diabetic subjects are: (a) Higher levels of total and alpha-2 protein-bound carbohydrate ; (b) wider range of these levels than in normals ; (c) rising levels of hexoses bound to serum protein with extensive vascular lesions ; (d) tendency for increased protein-bound carbohydrate to be reversible early in the course of the disease and to become permanent when vascular disease like nephropathy is established (Bradley, 1971).

Protein-bound carbohydrates are primarily found in the ground substance and basement membrane of normal people. Abnormal amounts have been demonstrated in blood vessels of the retina (Friedenwald, 1950), kidney (McManus, 1950) and other tissues (Warren *et al.*, 1959) of diabetics. The implications of increased synthesis of glycoproteins in diabetics seem to be: (a) Deposition in blood vessel walls might lead to vascular lesions, but normal and diabetic glomerular basement membranes contain galactose and glucose as the principal hexoses (Lazarow and Speidel, 1964) whereas serum glycoproteins contain galactose and mannose (Winzler, *loc. cit.*); (b) these may be abnormal glycoproteins, but no relative differences have been noted among sera of diabetics and normals (Sommers *et al.*, 1955); (c) liberation of glycoprotein from damaged blood vessel walls or a non-specific host reaction to vascular disease appear unlikely (Winzler, *loc. cit.*) and (d) increased glycoproteins may be formed in the microvasculature (Spiro, 1969).

The relationship of vascular disease to inadequate utilisation of glucose along insulin-dependent pathways are studies of serum beta-glucuronidase levels in diabetics and normals (Ditzel and Moinet, 1959 ; Hagenfeldt and Wahtherg, 1965; Miller *et al.*, 1966). Significantly increased serum levels have been found in diabetics but generally highest in patients with a long duration of the disease and in those with evidence of atherosclerosis. These authors suggested that the higher enzyme activity might reflect an increase in the non-insulin dependent glucuronic acid cycle for the disposal of excessive glucose. This points that increased enzyme activity is an indication of increased mucopolysaccharide and glycoprotein formation as a result of increased activation of this pathway.

It has been suggested that microangiopathy may be an antigen antibody reaction induced by insulin (Gellman *et al.*, 1958 ; Berns *et al.*, 1962; Blumenthal *et al.*, 1966). But typical lesions have also been reported in diabetics never treated with insulin (Freedman *et al.*, 1960). Whether this reaction is a cause of microangiopathy or a by-product of the diabetes is still to be determined.

Vaishnava *et al.* (1966, 1967) have observed an increase in free fatty acids, beta-lipoproteins and lipid phosphorus in diabetics as compared to the controls, the rise being more marked in diabetics with vascular complications especially Kimmelstiel-Wilson syndrome; but this lipid profile did not show any correlation with microangiopathy. Similar observations have been made by Sinha and Ghosh (1960) and Mathur *et al.* (1961).

ATHEROSCLEROSIS (MACROANGIOPATHY)

Factors which in the diabetic may account for the increased incidence, extent and severity of atherosclerosis could be: (1) Clinical atherosclerotic vascular disease is significantly influenced by the associated presence of microangiopathy ; (2) hyperglycaemia is related to or indicative of deposition or increased formation of simple or complex polysaccharides (LeCompte, 1955 ; Randerath and Diezel , 1959 ; Spiro, 1969) in the arterial wall ; and (3) diabetes increases the frequency of factors associated with enhanced atherogenesis, such as hypertension, hyperlipaemia and decreased fibrinolysis.

Various workers believe that microangiopathy does account for the increased severity of atherosclerosis (Havel, 1964 ; Herman and Gorlin, 1965). It is clear that the disease in small vessels may intensify disease in large vessels by impairing microcirculatory blood flow with increased intraluminal pressure and/or by involvement of *vasa vasorum* in the larger muscular arteries (Bradley, 1971). Yodaiken *et al.* (*loc. cit.*) have not found any clinical relationship between microangiopathy and atherosclerosis.

An association between hyperglycaemia and atherosclerosis is well documented (Hirsch *et al.*, 1953). Elevations of protein-bound carbohydrates, as seen in microangiopathy, have not been demonstrated in atherosclerosis, nor is there any relationship between hyperglycaemia and atherosclerosis (Frankl, 1964).

ASSOCIATED DISEASES

Although yet unsettled, most data appear to show a relationship between diabetes and hypertension. An incidence of 38 to 57·5 per cent has been reported by Western workers (Pell and Alonzo, 1967), whereas Indian workers reported it in 19·4 per cent patients (Vaishnava and Bhasin, 1969). The frequency increases with the duration of diabetes (Martensson, 1950 ; Pathania and Sachar, *loc. cit.* ; Shah, 1965 ; Vaishnava and Bhasin, 1969). Obesity, as a significant factor in the high incidence of small and large vessel disease, has been demonstrated in a long-term follow-up of 1500 diabetic patients (Buschman *et al.*, 1959 ; Shah *et al.*, 1966 ; Vaishnava *et al.*, 1968).

METABOLIC :

Lipid metabolism—A positive correlation between serum lipids and vascular disease is generally accepted, but the role of lipid abnormalities in the aetiopathogenesis of vascular disease is still controversial. Mathur *et al.* (1961) found elevated serum lipids in all diabetics without any significant correlation with the duration of diabetes or severity of the disease. Mathew *et al.* (1969) reported markedly elevated β-lipoprotein ratio in all diabetics with vascular complications as compared to the non-complicated and control subjects. Vinod Kumar *et al.* (1971) found elevated levels of serum triglycerides, pre-β-lipoproteins and $\beta:\alpha$ ratios in patients with these complications. They did not find any alteration in the lipoprotein lipase levels. The duration of diabetes, mode of treatment, and the degree of control did not have any significant role in determining the presence of vascular disease. These authors concluded that hyperlipaemia seems to be of endogenous origin, manifesting as hyper- pre-β-lipoproteinaemia and hypertriglyceridaemia. The changes in circulating lipid fractions do not indicate that atherosclerosis is accelerated or microangiopathy is produced as a result of hyperlipaemia (Ricketts, 1955). Specific fractions found to be elevated in uncontrolled diabetes are : Abnormal lipoproteins (Tuller *et al.*, 1954 ; Kolb *et al.*, 1955), esterified fatty acids (Hirsch *et al.*, *loc. cit.*) cholesterol and phospholipids (Harris *et al.*, 1953), triglycerides (Albrink *et al.*, 1958), nonesterified fatty acid (Gordon and Cherkes, 1956) and chylomicrons (Finley, 1961). Bagdade *et al.* (1967) demonstrated that uncontrolled diabetes is associated with Type I hyperlipoprotaeinemia, whereas in patients apparently free of atherosclerosis or microangiopathy, circulating lipid levels were normal despite the liberal fat intake (Bagdade *et al.*, *loc. cit.*).

Carbohydrate metabolism—Transient hyperglycaemia, using G.T.T. or prednisolone-primed G.T.T., has been observed in 52 to 100 per cent patients after acute myocardial infarction (Ahuja *et al.*, 1965 ; Datey and Nanda, 1966 ; Mathur *et al.*, 1969), whereas 41 to 78 per cent prevalence of high blood sugar during acute myocardial infarction has been reported by Western workers (Waddell and Field, 1960; Puttanna, 1966). Samani (1963) observed a mild diabetic type of G.T.T. in 75 per cent of diabetics with IHD and has suggested that mild diabetics are more prone to this complication. Sowton (1962) and Datey and Nanda (*loc. cit.*) observed hyperglycaemia in myocardial infarction in 71, 47 and 27 per cent patients immediately after the attack, 1 month after and 1 to 3 years after, respectively. The authors have suggested that myocardial infarction unmasks latent diabetes in some patients and that initial normoglycaemics are unlikely to develop diabetes later.

Fibrinolytic activity—Blood fibrinolytic activity was found to be lower in diabetes than in age-matched controls. Fibrinolytic activity did not correlate with the duration of diabetes, choleserol level, or blood glucose level. This decreased fibrinolysis has been blamed for increased atherosclerosis (Fearnley *et al.*, 1963 ; Baggchi *et al.*, 1970). However, Gupta and Joseph (1969) found significant correlation between serum cholesterol and serum fibrinolytic activity. The combined views of phenformin and ethyloestrinol has been shown to cause increase in fibrinolysis and reduction in platelet stickiness ; when given alone this effect is not observed (Fearnley *et al.*, 1967). But this observation needs further confirmation.

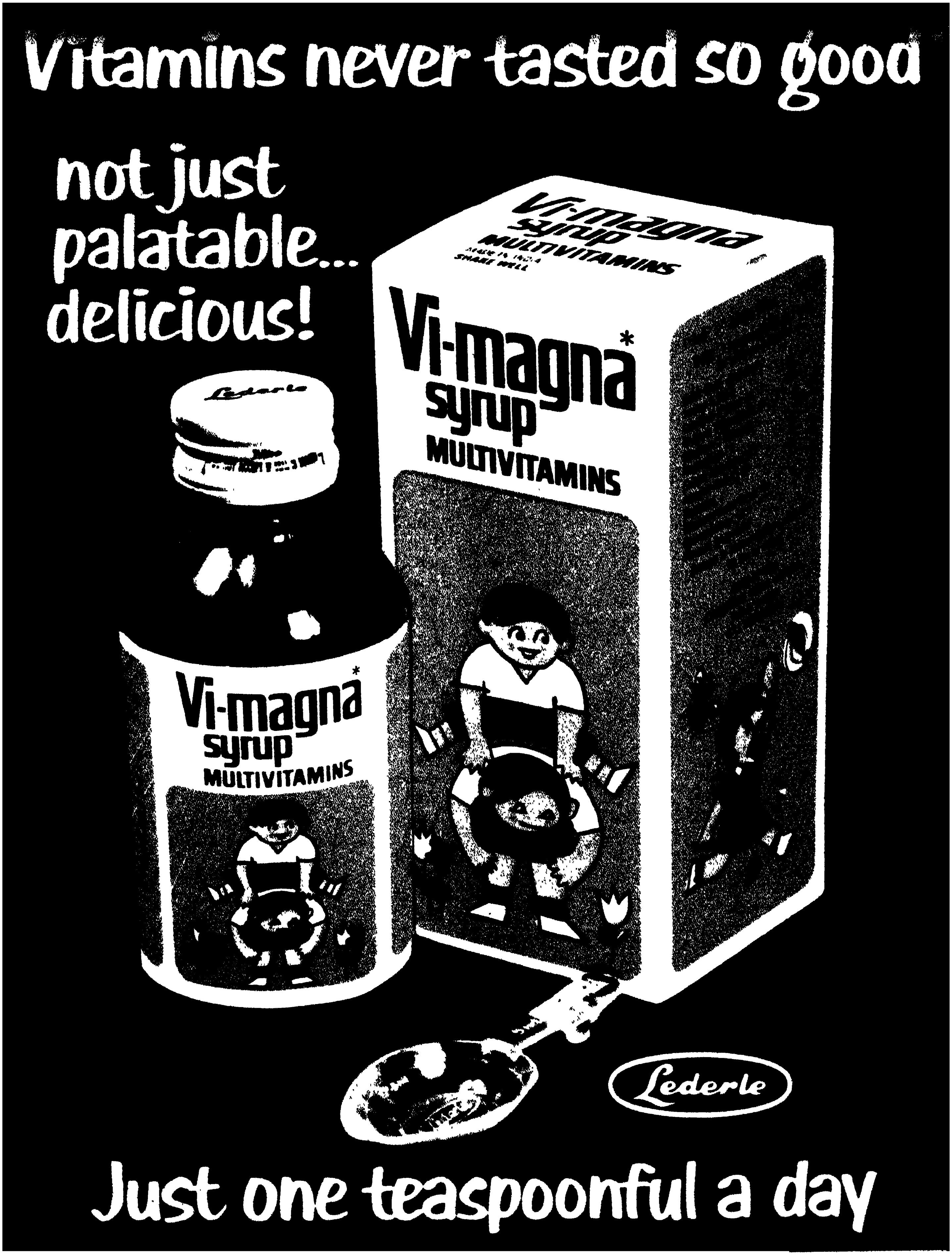
CLINICAL :

Ischaemic heart disease—IHD is considered to be the most common cause of morbidity and mortality in diabetes mellitus. Western observers have found a higher incidence of this complication, i.e., 14 to 74 per cent (Root *et al.*, 1939 ; Stearns *et al.*, 1947 ; Bradley and Bryfogle, 1956). Indian literature on clinical studies have shown a comparatively low incidence varying from 7·29 to 33·3 per cent (Patel and Dhirwani, 1959 ; Pathania and Sachar, *loc. cit.* ; Sinha and Ghosh, 1960 ; Vaishnava *et al.*, 1964 ; Vaishnava *et al.*, 1966). Clinical and/or resting electrocardiographic prevalence of this complication varies from 7·5 to 35 per cent (Vaishnava *et al.*, 1964 ; Ahuja and Tandon, 1966 ; Pathania and Sachar, *loc. cit.*), which is comparatively lower than that reported in Western literature (Bradley and Bryfogle, *loc. cit.* Lundback, 1954). Latent IHD in diabetics as revealed by the Master's double step test is 17·5 per cent as reported by Vaishnava *et al.* (1968), which is in accordance with that reported by Samani (1963). Many workers have reported increasing prevalence of atherosclerotic heart disease with the rising age of diabetics (Shah, *loc. cit.* Malhotra and Pathania, 1968). Ricketts (*loc. cit.*) reported an equal incidence of IHD in diabetics in both the sexes, while Dunlop (1954) thought that females predominate. Indian studies have not shown any predilection for any sex (Vaishnava *et al.*, 1968 ; Pathania and Sachar, *loc. cit.*). These authors believe that diabetes removes the relative immunity against atherosclerotic vascular involvement in women.

Silent myocardial infarction has been described to be more frequent in diabetics especially with long standing disease, the reported incidence varies from 24 to 60 per cent (Bradely and Schnfel, 1962 ; Agar, 1962 ; Banerjee, 1966). ECG studies have not shown any special predilection for any region (Sanyal and Mitra, 1956). In the diabetic patient the abrupt onset of congestive cardiac failure with or without pain should always raise the question of infarction as the precipitating cause (Bradley, 1971).

Hypertension—Increased frequency of hypertension among diabetics is yet uncertain, but most data appear to show a relationship between diabetes and hypertension. Western literature reports an incidence of 38—57·5 per cent (Wetherby, 1932 ; Edeiken, 1945), whereas, Indian authors reported an incidence varying from 13·3—45·3 per cent (Shah *et al.*, 1968 ; Vaishnava and Bhasin, 1969 ; Banerjee, *loc. cit.*). Hypertension is more frequent in the older age-group diabetes as observed by Vaishnava and Bhasin (1969) and Pathania and Sachar (*loc. cit.*) and Wig *et al.* (1953). These authors have reported hypertension in diabetics which was almost equally distributed between the two sexes. This complication seems to be more common in patients with diabetes of longer duration (Lall and Bahl, 1967). Kimmelsteil-Wilson (KW) syndrome and pyelonephritis, contribute to hypertension in about 10-20 per cent cases. Associated IHD, cerebrovascular accidents and retinopathy are more frequently seen in hypertensive diabetics (Freedman *et al.*, 1958 ; Vaishnava and Bhasin, 1969 ; Pathania and Sachar, *loc. cit.*).

Diabetic nephropathy—K-W syndrome has been reported in 2—14 per cent of Indian diabetics (Koshy *et al.*, 1966 ; Urs, *loc. cit.* ; Mukerjee *et al.*, *loc. cit.*), whereas, Thomsen (1965) reported an incidence of less than 1 per cent in Western population. The majority of the patients had diabetes for more than 5 years and showed a good correlation between the duration and K-W syndrome. Constant proteinuria, which is the hallmark of nephropathy was found to be associated with some degree of glomerulosclerosis in 75 per cent of the diabetics (Thomsen, *loc. cit*). Gellman *et al.* (1959 a, b) found that progressive worsening of the clinical manifestations of the K-W syndrome correlated well with the diffuse glomerulosclerosis, rather than with the



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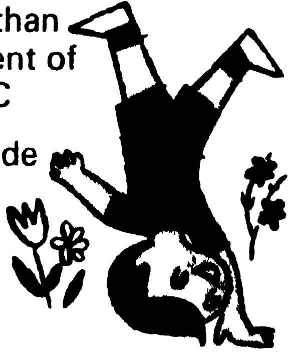

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nodular lesions. They also observed a close relationship between diffuse lesions and elevated blood pressure, proteinuria and increased serum creatinine levels. Indian workers have reported diffuse glomerulosclerosis in 42—90 per cent (Gupta and Chakravarti, 1964; Mathur *et al.*, 1960) The renal lesion has no direct relationship with the severity of diabetes or its duration (DeZoysa, *loc. cit.* Gupta and Chakravarti, *loc. cit.*; Mathur *et al.*, 1964; Vaishnava *et al.*, 1971). Mathur *et al.* (1964) found intercapillary glomerulosclerosis in 31 out of 32 patients; 23 had diffuse lesions, 4 had diffuse and exudative lesions and 2 had a combination of diffuse, nodular and exudative lesions. They observed nodular lesions in older patients with longer duration diabetes and concluded that the diffuse lesion is the first to appear. Mathur *et al.* (1967) reported normal renal function in 27 out of 31 cases with renal lesions and concluded that renal function tests have no correlation with the histological picture.

Cerebrovascular disease—The prevalence of cerebrovascular diseases ranges from 1·7 to 17·1 per cent (Larson, 1967; Ahuja and Tandon, *loc. cit*; Mukerjee *et al.*, *loc. cit.*). Vascular insufficiency and cerebral thrombosis have been claimed to be associated with atherosclerotic lesions. Intracerebral haemorrhage has been extremely uncommon in diabetics as compared to patients of occlusive vascular disease (Bradley, *loc. cit.*). Shah (*loc. cit.*) observed that 17 out of 22 patients with CVD had hypertension or associated IHD.

Peripheral vascular disease- The prevalence of peripheral vascular disease (PVD) in Indian diabetics varies from 2·4-13·7 per cent (Mukerjee *et al.*, *loc. cit.*; Ahuja and Tandon, *loc. cit.*; Shah, *loc. cit.*), whereas, it is significantly higher in the Western population. Tulloch (*loc. cit.*) reported this complication in 5·5 per cent of Jamaican diabetics.

Diabetic retinopathy—4·8 to 23·5 per cent of diabetics have been know to have some degree of retinopathy (Waite and Beetham, 1935). Hardin *et al.* (1956) reported it in 8-46·6 per cent, which is approximately the same as reported by various Indian workers (Shah, *loc. cit.*; Ahuja and Tandon, *loc. cit.*; Mathur *et al.*, 1960; Vaishnava *et al.*, 1964; Malik *et al.*, 1970). Puttana (*loc. cit.*) reported a male : female ratio of 32 : 14. Some workers have reported a definite correlation between retinopathy and clinical nephropathy (Pathania and Sachar, *loc. cit.*). It is believed that the duration of diabetes plays a direct role in the causation of retinopathy (Bradley, *loc. cit.*; Mehra and Rajyashree, 1966). At the Joslin Clinic, the control of diabetes during the first 5-10 years of the disease is considered of importance in the prevention of complications of the eye and kidney. Malik *et al.* (*loc. cit.*) reported vascular changes in retinopathy with fluorescine angiography where ophthalmoscopy was normal. Angiography demonstrates microaneurysms, early neovascularisation and retinitis proliferans. They also demonstrated loss of the normal fine reticular pattern of the capillary bed, dilated capillaries and A-V shunts. Proliferative retinopathy has been shown to occur in association with nephropathy, coronary arteriosclerosis specially in persons below 40 years of age and those who have received as no therapy or inadequate therapy (Root *et al.*, 1954).

EFFECTS OF TREATMENT ON CARDIOVASCULAR DISEASE

At the annual meeting of the American Diabetes Association in St. Louis in June, 1970 participants reported 823 patients treated with either placebo, tolbutamide (1·5 g. daily), and insulin. They found higher incidence of cardiovascular complications (12·7 per cent) with tolbutamide as compared to 4·9 per cent with placebo.

Long-term benefits of dietary alterations in preventing vascular disease are yet to be proved, both in the non-diabetic and diabetic patients. Diet control to some extent helps in restoring circulating blood lipids to normal levels. Reversal of hyperlipaemia associated with ingestion of high carbohydrate, low fat diets has been produced by the replacement of saturated with unsaturated fats (Kinsell, 1954; Ahrens, 1957). This may result in reduction of blood cholesterol, total lipids, triglycerides and low density lipoproteins.

Clofibrate produces significant reduction in cholesterol and triglyceride levels, more so helpful in retinopathy (Oliver, 1967).

SUMMARY

In spite of Indian diabetics still suffering commonly from infections including pulmonary tuberculosis and diabetic coma, cardiovascular complications—IHD, hypertension, nephropathy, cerebrovascular disease, retinopathy and peripheral vascular disease—are emerging as leading causes of morbidity and mortality.

The duration of diabetes, obesity, and associated hypertension favour the higher incidence of IHD. Silent myocardial infarction has been observed in 24 to 60 per cent patients. There is some evidence that tolbutamide and phenformin increase the incidence and the mortality due to these complications in diabetics. Such patients are more prone to hypertension, so much so that after the age of 40, 19·4 per cent have this complication as compared to 4·8 per cent below this age. Diabetic nephropathy, both clinical and symptomatic, has been seen in 42 to 97 per cent of all diabetics. There is some

evidence that peripheral vascular disease is not as common in India as in the West. The prevalence of cerebrovascular accidents is not high unless it is complicated by hypertension. The incidence of retinopathy in Indian diabetics is in the same range as reported from other countries. Hypertension, longer duration of diabetes and irregular control of the disease in most of the cases seems to increase the incidence. Serum lipid fractions are increased in the uncontrolled state but even in the well controlled state they remain in the higher range, more so in those who have IHD. Although most of the diabetics will eventually develop one or more of these complications, yet it is believed that proper diet, control of the disease especially in the earlier stages, can at least retard the progress of these complications.

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2

Correlation of Amylase Activity with Ascorbic Acid

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Ascorbic acid in the body influences the activities of quite a good number of enzymes. The metabolism of this biologically important substance is not well understood. Because of the close chemical nature with carbohydrates, ascorbic acid is considered as a derived carbohydrate and is often claimed to be a diabetogenic factor. It is, therefore, quite natural to presume that glycosidase enzyme system influences the metabolism of ascorbic acid in the body. The correlation of ascorbic acid with a number of enzyme systems has been suggested but no study to correlate ascorbic acid with amylase enzyme system is available in the literature.

It is, therefore, aimed in the present study to investigate the probable correlation of ascorbic acid in the amylase enzyme system of the body. The present study is only the initial investigation of the problem.

MATERIAL AND METHOD

83 male healthy volunteers were grouped into two : the first group (group A) consisted of 62 and in the second group (group B) there were 21 male healthy volunteers. In the first group plasma ascorbic acid, serum amylase, urinary amylase, were estimated under the normal and similar type of the diet. In the second group the estimations of serum amylase, urinary amylase and the plasma ascorbic acid were done followed by the administration of 500 mg. of ascorbic acid intravenously and after 30 minutes, the estimations were repeated.

The blood was collected from the antecubital vein in the postabsorptive period and 5 ml. of blood was transferred to a sterile centrifuge tube containing one drop each of 20 per cent potassium oxalate and 5 per cent potassium cyanide for the estimation of plasma ascorbic acid and the remaining 3 ml. of blood was transferred to a sterile, dry centrifuge tube. The plasma and the serum were separated by centrifuging for 10 minutes at 2000-5000 r.p.m. The estimations were completed on the same day as of collection of the samples.

24-hour sample of urine was collected in a bottle containing a few drops of toluene as a preservative.

The plasma ascorbic acid was estimated following the method of Mindlin and Butler (1937), serum amylase was determined by Loon *et al.* (1952) modification of Huggins and Russel (1948) method, and the urinary amylase was measured by the Wohlgemuth method (1908).

RESULTS

The plasma ascorbic acid in the present series of cases of group A was found to vary between 0·48 mg.-0·91 mg. per cent. The frequency of distribution of the plasma ascorbic acid is shown in Fig. 1, and it was evident that the majority of the subjects had the plasma ascorbic acid within the range of 0·60-0·71 mg. per cent and only in 5 cases i.e., 8·06 per cent of the total subjects had plasma ascorbic acid towards the lowest normal value. 3 subjects had the plasma ascorbic acid level about 0·84 mg. per cent.

The serum amylase in these 62 healthy adults was found to vary between 10-20 units. It was noted that 29 cases i.e., 46·7 per cent of the total

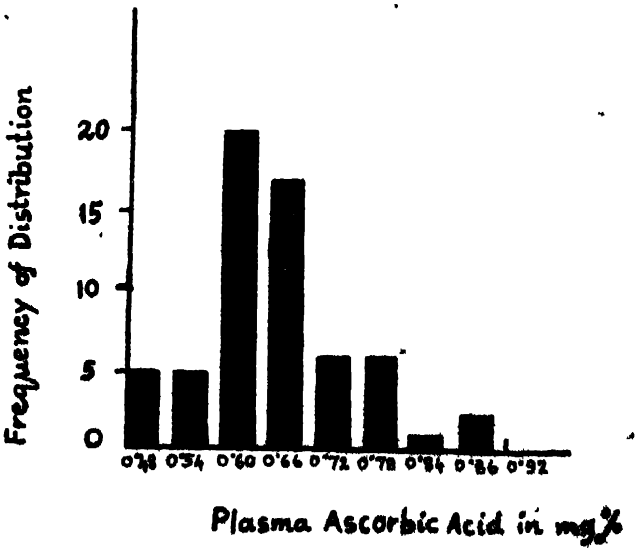

FIG. 1—SHOWING THE FREQUENCY OF DISTRIBUTION OF PLASMA ASCORBIC ACID IN 62 HEALTHY ADULTS

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* M.D., D.Phil., Assistant Professor of Biochemistry

** M.B.B.S., D.Phil., Ph.D., F.C.G.P., Professor and Head of the Department of Biochemistry subjects investigated had the serum amylase activities within the range of 10-12 units, 20 subjects i.e. 32·2 per cent had the activities between 13-15 and only 13 subjects i.e. 20·9 per cent had the serum amylase in the range of 19-21 units (Fig. 2).

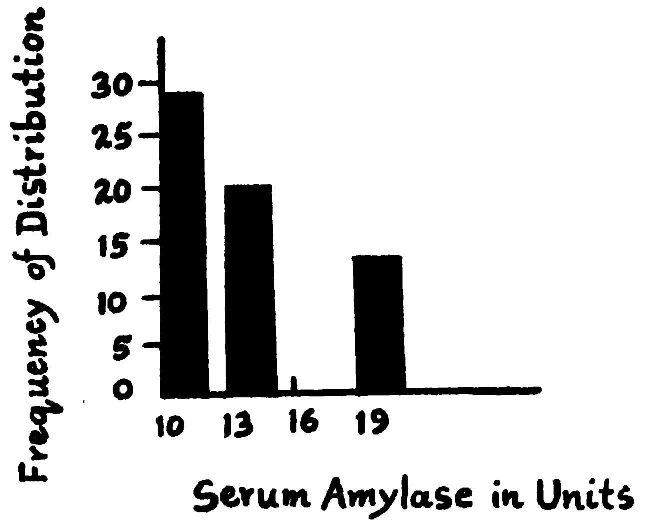

FIG. 2—SHOWING THE FREQUENCY OF DISTRIBUTION OF SERUM AMYLASE ACTIVITIES

The corresponding urinary amylase activities in these 62 healthy subjects were noted to vary between 4 and 20 units. In the majority of the cases the urinary amylase was found to be in the range of 8-11 units, the next highest incidence being in the range of 4-7 units. In 15 subjects i.e., 24·1 per cent of the total cases investigated, the urinary amylase was found to be between 12 and 15 units and only in 2 cases a value ranging between 20 and 23 units was observed (Fig. 3).

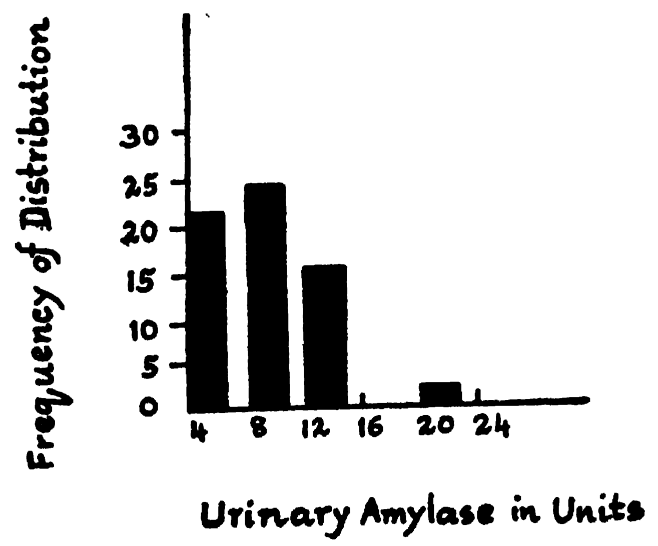

FIG. 3—SHOWING THE FREQUENCY OF DISTRIBUTION OF URINARY AMYLASE IN 62 HEALTHY ADULTS

In group B, 21 healthy subjects were investigated before and after the administration of 500 mg. of ascorbic acid and the results are tabulated in Table 1.

TABLE 1—SHOWING THE PLASMA ASCORBIC ACID, SERUM AMYLASE AND URINARY AMYLASE IN 21 HEALTHY SUBJECTS OF GROUP B BEFORE ADMINISTRATION OF 500 MG. OF ASCORBIC ACID INTRAVENOUSLY

Subject No.	Before ascorbic acid administration			After ascorbic acid administration		
	Plasma ascorbic acid	Serum amylase	Urinary amylase	Plasma ascorbic acid	Serum amylase	Urinary amylase
1	0·50	10	10·0	0·90	15	20·0
2	0·60	10	6·7	1·00	20	10·0
3	0·56	10	14·3	1·40	15	28·6
4	0·64	10	10·0	1·44	12	14·3
5	0·70	10	6·7	1·90	20	28·6
6	0·60	10	6·7	1·50	15	20·0
7	0·60	12	10·0	1·40	20	28·6
8	0·50	15	6·7	1·30	20	20.0
9	0·70	10	6·7	2·00	20	28·6
10	0·65	15	6·7	1·86	20	20.0
11	0·60	10	10·0	1·20	15	20·0
12	0·50	10	10·0	1·20	15	20·0
13	0·50	10	6·7	1·10	12	14·3
14	0·60	15	6·7	1·80	20	20.0
15	0·65	10	6·7	1·70	15	20·0
16	0·60	10	6·7	1·60	20	20.0
17	0·52	15	4·0	1·56	20	10·0
18	0.60	10	10·0	1·60	20	28·6
19	0·50	10	10·0	1·50	15	20·0
20	0·60	10	6·7	1·60	15	14·3
21	0·60	10	6·7	1·80	20	20·0

It was observed that the plasma ascorbic acid level before the administration of ascorbic acid in this group varied between 0·5 and 0·7 mg. per cent and the majority of the cases i.e., 47·6 per cent of the total had the plasma ascorbic acid level within the range of 0·56 mg.-0·61 mg. per cent. In 6 subjects i.e., 28·6 per cent of the total subjects of the group B series, the plasma ascorbic acid level was found to vary between 0·5 and 0·55 mg. per cent and only in 3 and 2 subjects the plasma ascorbic acid level varied between 0·62-0·67 mg. per cent and 0·68-0·73 mg. per cent respectively, whereas, after the administration of ascorbic acid, the range was found to vary between 0·9 and 2·0 mg. per cent.

In a bigger number of cases i.e., 28·6 per cent of the total of the group B, the plasma ascorbic acid level was found to vary between 1·5-1·6 mg. per cent in 4 subjects the level was noted to be between 1·3-1·4 mg. per cent and in 14·3 per cent of the cases, the plasma ascorbic acid was observed to be within the range of 1·1-1·2 mg. per cent, 1·7-1·8 mg. per cent cent and 1·9-2·0 mg. per cent each. The plasma ascorbic acid in the lower range i.e., 0·9-1·0 mg. per cent was noted only in 2 subjects (Fig. 4).

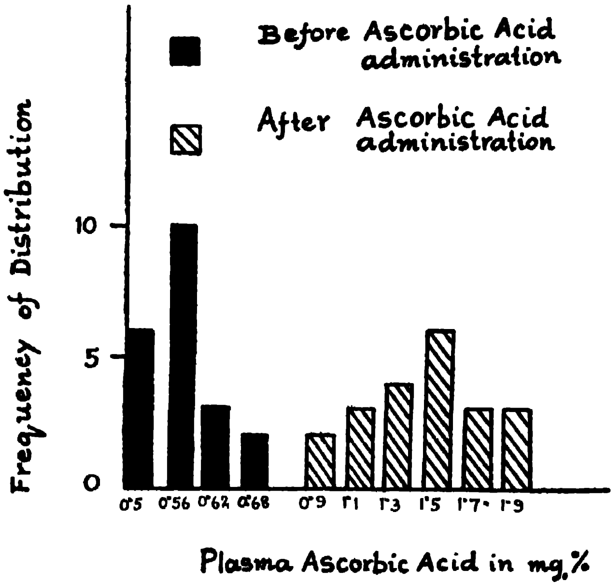

FIG. 4—SHOWING THE FREQUENCY OF DISTRIBUTION OF PLASMA ASCORBIC ACID BEFORE AND AFTER ASCORBIC ACID ADMINISTRATION

The serum amylase activities in this group before the administration of ascorbic acid was noted to vary between 10-15 units and the percentage distribution of the serum amylase activities in these 21 subjects is shown in Table 2 and Fig. 5.

It was evident from the tabulated result that in the majority of the cases i.e., 76·19 per cent of the cases the serum amylase was only 10 units before the administration of ascorbic acid; but after the administration of 500 mg. of ascorbic acid the range of serum amylase was found to vary between 12-20 units and in the majority of cases i.e., 52·38 per cent of the total, the serum amylase was found to be 20 units.

The urinary amylase in these 21 subjects of the group B before administration of ascorbic acid was found to vary between 4 and 14·3 units, majority of the cases i.e., 57·14 per cent had the urinary amylase level of 6·7 units; whereas, after the administration of the ascorbic acid the level was noted to vary between 10·0 and 28·6 units and majority of the cases i.e., 57·14 per cent of the total cases had the urinary amylase of 20 units (Table 3).

TABLE 2—SHOWING THE PERCENTAGE DISTRIBUTION OF SERUM AMYLASE BEFORE AND AFTER ADMINISTRATION OF 500 MG. OF ASCORBIC ACID INTRAVENOUSLY

Serum amylase (units)	Before administration	After administration
	No. of cases	No. of cases
10	16 (76·19)	Nil
11	Nil	Nil
12	1 (4·76)	2 (9·52)
13	Nil	Nil
14	Nil .	Nil
15	4 (19·04)	8 (39·09)
16	Nil	Nil
17	Nil	Nil
18	Nil	Nil
19	Nil	Nil
20	Nil	11 (52·38)
Total	21 (99·99)	21 (99·99)

* Figures in parentheses indicate percentage

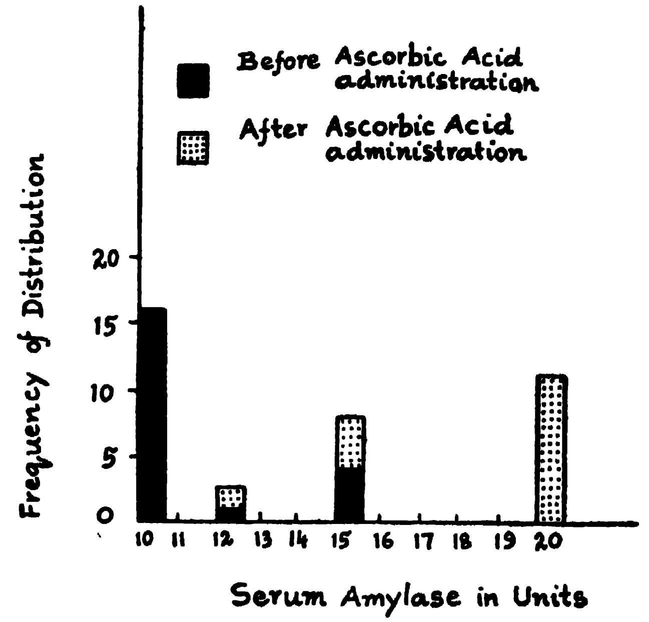

FIG. 5—SHOWING THE FREQUENCY OF DISTRIBUTION OF SERUM AMYLASE ACTIVITIES BEFORE AND AFTER ASCORBIC ACID ADMINISTRATION IN 21 HEALTHY ADULTS

TABLE 3—SHOWING THE PERCENTAGE DISTRIBUTION OF URINARY AMYLASE BEFORE AND AFTER ADMINISTRATION OF 500 MG. OF ASCORBIC ACID INTRAVENOUSLY IN HEALTHY ADULTS (GROUP B)

Urinary amylase (units)	Before administration	After administration
	No. of cases	No. of cases
4·0	1 (4·76)	Nil
6·7	12 (57·14)	Nil
10·0	7 (33·13)	2 (9·52)
14·3	1 (4·76)	3 (14·29)
20·0	Nil	12 (57·14)
28·6	Nil	4 (19·04)
Total	21 (99·99)	21 (99·99)

* Figures in parentheses indicate percentage

The mean concentration of plasma ascorbic acid, mean serum amylase and urinary amylase activities of group A and group B before the administration of ascorbic acid is shown in Table 4.

TABLE 4—SHOWING THE MEAN CONCENTRATION OF PLASMA ASCORBIC ACID, SERUM AMYLASE, URINARY AMYLASE OF GROUP A AND GROUP B BEFORE ADMINISTRATION OF 500 MG OF ASCORBIC ACID

	Group A			Group B		
	Ascorbic acid	Serum amylase	Urinary amylase	Ascorbic acid	Serum amylase	Urinary amylase
Mean ...	0·64	13·8	10·2	0·59	11·00	8·00
S.D. ...	0·09	3·86	3·4	0·06	1·69	2·34

Table 5, shows the comparison of the mean values of the plasma ascorbic acid, serum amylase of group B, before and after the administration of 500 mg. of ascorbic acid intravenously.

TABLE 5—SHOWING THE COMPARISON OF THE MEAN VALUES OF THE PLASMA ASCORBIC ACID, SERUM AMYLASE AND URINARY AMYLASE IN 21 HEALTHY ADULTS BEFORE AND AFTER ADMINISTRATION OF 500 MG. OF ASCORBIC ACID INTRAVENOUSLY

	Before administration			After administration		
	Ascorbic acid	Serum amylase	Urinary amylase	Ascorbic acid	Serum amylase	Urinary amylase
Mean ...	0·59	11·00	8·00	1·49	17·30	19·80
S.D. ...	0·06	1·69	2·34	0·28	2·91	5·64

DISCUSSION

The mean serum and urinary amylase values observed in the present investigation are within the normal range observed by the other workers following the same method as in the present investigation. The excretion of urinary amylase is in no way related to the volume or to the specific gravity of the urine. The urinary amylase value of 14·3 units was observed in the healthy individuals whose 24 hours' urine volumes were found to be 600 ml. and also 1700 ml.; on the other hand, the urinary amylase value of 4 units which was the lowest value observed in the present investigation was also obtained in the individual with urinary volume of 1560 ml. per day. Similarly, urinary amylase of 6·7 units was noticed in individuals whose 24 hours' urinary volume were 2020 ml. and 1200 ml. respectively.

The mean plasma ascorbic acid values observed both in group A and group B before the administration of ascorbic acid were without any significant difference and though the mean values were within the normal range, but found to be lower than the value observed earlier in 16 healthy adults of the same age group (Saha and Goswami, 1968).

Though not constant, a close relationship between the plasma ascorbic acid level and serum amylase activity was noted in the subjects of both group A and group B. However, this close relationship was more marked in group B., where after the administration of ascorbic acid there was almost two fold increase in the serum amylase and the urinary amylase with the corresponding rise in the plasma ascorbic acid concentration. With the present data it is not possible to explain the cause of such an increase in the amylase activities after the administration of ascorbic acid but the hypothesis might be suggested. It might be that with the extra ascorbic acid administration, more enzyme is necessary for the metabolism of the vitamin; or the administration of ascorbic acid somehow or otherwise stimulates the factor/factors to release the enzyme to the circulation. This factor or factors might even be the hormones like adrenaline. There is no evidence at present available indicating the necessity of amylase for the metabolism of ascorbic acid; moreover, if it would have been utilised for the metabolic processes of the ascorbic acid, the amount of urinary amylase would not have been increased and hence it is likely that the trigger phenomenon is released by administration of ascorbic acid resulting in higher concentration of amylase both in the plasma and urine. But the data and literature are neither available nor sufficient to prove or disprove any one of these hypotheses and further work is being done in this laboratory.

SUMMARY

Plasma ascorbic acid, serum amylase, urinary amylase, 24 hours' volume and specific gravity of urine were estimated in two groups of healthy adults. In group A, there were 61 and in group B, there were 21 subjects. In group B, the estimation were done before and after the administration of 500 mg, of ascorbic acid intravenously.

The plasma ascorbic acid in 62 subjects of group A was found to vary between 0·48 mg. and

0·91 mg. per cent with the mean value of 0·64 ± 0·09 mg. per cent.

The serum amylase in group A was found to vary between 10-20 units with the mean value of 13·8 ± 3·86 units.

The urinary amylase in group A was noted to vary between 4-20 units with the mean value of 10·2 ± 3·4 units.

In group B, the plasma ascorbic acid before the administration of vitamin C was noted to vary between. 0·50-0·70 mg. per cent with the mean value of 0·59 ± 0·06 mg. per cent and after 500 mg. of ascorbic acid administration, the concentration varied between 0·90-2·00 mg. per cent with a mean value of 1·49 ± 0·28 mg. per cent.

In group B, the serum amylase before treatment with ascorbic varied between 10-15 units with a mean value of 11·00 ± 1·69 units and after the treatment with ascorbic acid the amylase level ranged between 12-20 units with a mean of 17·30 ± 2·91 units.

The urinary amylase in group B, before and after administration of ascorbic acid varied respectively between 4·0-14·3 units and 10·0-28·6 units with mean of 8·00 ± 2·34 and 17·30 ± 2·91 units.

A close relationship between the plasma ascorbic acid level and serum amylase was noticed with an increase of two folds in the concentration of plasma ascorbic acid, serum and urinary amylase activities after the administration of 500 mg. of ascorbic acid intravenously. The probable mechanisms of this increase were suggested by putting forward two hypotheses.

ACKNOWLEDGMENT

The authors are thankful to the student volunteers of Gauhati Medical College for their co-operation and to M/s Glaxo Laboratories Pvt. Ltd., Gauhati for the supply of the ampoules of ascorbic acid (celin).

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3

Comparative Study of the Clinical Effects of Ibuprofen and Indomethacin in Rheumatoid Arthritis

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Ibuprofen is 2 (4-isobutyl phenyl propionic acid) with a molecular weight of 206 and is known to possess anti-inflammatory, analgesic and antipyretic properties in various arthritic conditions. After an oral dose, the drug is absorbed and maximum plasma levels occur in 1½ hours, falling off after 3 hours. The effectiveness of ibuprofen (200 mg. of drug per capsule) was compared with that of a placebo (300 mg. of lactose per capsule) and indomethacin (25 mg. of drug per capsule). All were given orally thrice a day, by a double blind cross over trial.

MATERIAL AND METHOD

35 patients who satisfied the American Rheumatism Association criteria (1959) for the diagnosis of rheumatoid arthritis were studied in detail.

CLINICAL ASSESSMENT :

The following examinations were made before starting therapy and at the end of each treatment period.

Spontaneous pain over the joints—Subjective assessment.

Early morning stiffness—Assessed by noting the time taken to move about freely after getting up from bed.

Mobility of joints—Assessed by noting the degree of passive movements at the individual joints affected without causing pain.

Time taken to walk 10 metres in second :

Joint swelling—The circumference at fixed points around the bigger joints was recorded. As regards finger joints, the change in size was noted by using a set of jewellers rings.

Grip strength—This was recorded by using a sphygmomanometer. The patient was made to squeeze the rubber bulb for 15 seconds and the average of three readings was taken for each hand.

Intermalleolar straddle—This was recorded by noting the maximum separation achieved by the

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examiner between the medial malleoli of the ankles. Mild to moderate pain at the hips was inevitable in this procedure.

Joint tenderness—This was assessed objectively by exerting pressure over the joints using the piston of a metal syringe connected to a mercury manometer and recording the pressure at the mercury column.

INVESTIGATIONS

Complete urinalysis, stool examination for occult blood, ESR at 1 hour, serum asparate and alanine transaminases (SGOT and SGPT), serum alkaline phosphatase, haemoglobin level, total and differential leucocyte counts, blood urea, serum uric acid, fasting blood sugar, latex agglutination test for rheumatoid factor and x-ray of affected joints were done before starting treatment and at the end of each treatment period. All the patients were followed up for six months after the trial to detect any delayed toxicity.

THERAPY

After completing the preliminary investigations to assess the severity of the condition, the patients were allotted at random to a course of treatment. Each course of treatment consisted of 3 bottles marked A, B and C which contained 21 physically similar capsules. Bottles A and C contained capsules of 200 mg. of ibuprofen or 25 mg. of indomethacin (the total weight of all capsules being adjusted at 300 mg. by adding lactose) allotted at random. Bottles B always contained placebo—300 mg. of lactose. The drugs were administered in the serial order of A, B and C, thereby ensuring that there was a period on placebo in between ibuprofen and indomethacin and any carry over effect could thus be eliminated. None of the observers knew about the composition of the capsules during the period of study and the key was made available only after the study was completed.

Out of 35 patients only 28 completed the course. 4 patients did not come for later follow-up. There were 6 males aged between 16-45 years and 22 females aged between 20-65 years.

The clinical data are summarised in Table 1.

History of previous drug therapy was positive in 27 cases. Many of the patients received various drugs in successive course or in combination.

PRE-TREATMENT DATA :

Joint pains—present in 27 cases.
Early morning stiffness—present in 21.
Measurable swelling of joints—present in 25.

TABLE 1—SHOWING JOINTS AFFECTED AND DURATION OF SYMPTOMS

	No. of cases
JOINT AFFECTED	
Multiple (generalised)	15
Small joints of hands and feet only ...	24
Wrist, elbow or shoulder only ...	20
Spine only	5
Hips only	2
Knees only	15
Ankles only	12
Temporomandibular only	1
DURATION OF SYMPTOMS	
Less than 6 months (2 weeks to 20 weeks)	8
6 months to 1 year	5
1-2 years	2
Over 2 years	13

Joint tenderness—present in all.
ESR at 1 hour—ranged from 8-150 mm.
SGOT—5-18 I.U (normal range up to 15 I.U.).
SGPT—2·1 to 16·3 I.U. (normal range up to 20 I.U.).
Haemoglobin—8-14·5 g. per cent.
Total leucocyte count—5200-11,000/c.mm.
Blood urea—18-28 mg./100 ml.
Serum uric acid—Normal in 23 cases ; raised (over 5·3 mg.) in 5 cases.
Serum alkaline phosphatase—4·3 to 20 K.A. unit.
Rheumatoid factor detected by latex agglutination test—positive in all.

THERAPEUTIC RESPONSE :

Tables 2 and 3 show the response to therapy during each treatment period.

Long term follow-up of these cases showed no significant difference in the three groups as regards symptomatology, clinical grading or side effects.

STATISTICAL ANALYSIS OF THE RESPONSE :

In this experiment the performance of two drugs —ibuprofen in a dose of 600 mg./day and indomethacin in a dose of 75 mg. per day has been compared. The two drugs together with a placebo were administered to 28 patients in a strictly random manner. The results of 24 patients who completed the trial satisfactorily strictly according to schedule are analysed.

The degree of relief experienced by the patients with regard to the following eight symptoms on administering the drug has been recorded objectively.

TABLE 2—SHOWING RESULTS OF THERAPY

Clinical feature	Ibuprofen			Placebo			Indomethacin		
	Improved	Deteriorated	No change	Improved	Deteriorated	No change	Improved	Deteriorated	No change
Pain	15		13	10	—	18	16	—	12
Early morning stiffness	13	2	13	10	—	18	13	—	15
Mobility	9	--	19	9	---	19	7	—	21
Time taken to walk 10 metres ...	11	--	17	11	3	14	16	—	12
Joint swelling	13	5	10	8	14	6	11	4	13
Grip strength	26	--	2	15	11	2	22	6	—
Inter-malleolar straddle	4	2	22	5	2	21	4	—	24
Joint tenderness	14	1	13	10	1	17	10	—	18
Pressure tolerance	21	1	6	16	4	8	23	1	4
Body weight	no change			no change			increase in 1		
Blood pressure	no change			no change			no change		

TABLE 3—SHOWING OBSERVATION ON LABORATORY INVESTIGATIONS DURING EACH TREATMENT PERIOD

Laboratory finding	Ibuprofen		Placebo		Indomethacin	
	Present	Absent	Present	Absent	Present	Absent
Appearance of albuminuria	nil	28	nil	28	nil	28
Occult blood in stools	nil	28	nil	28	nil	28
Rise in ESR	4	24	7	21	6	22
Rise in SGOT	9	6	7	8	6	9
Rise in SGPT	8	7	8	7	7	8
Rise in serum alkaline phosphatase ...	4	24	6	22	4	24
Fall in haemoglobin	nil	28	nil	28	nil	28
Alteration in total and differential count ...	nil	28	nil	28	nil	28
Rise in blood urea	8	20	12	16	13	15
Rise in serum uric acid	6	22	8	20	8	20
Rise in fasting blood sugar	12	16	11	17	13	15
Change is the latex agglutination test ..	nil	28	nil	28	nil	28

SYMPTOMS :

(1) Pain, (2) early morning stiffness, (3) mobility, (4) time taken to walk 10 metres, (5) joint swelling, (6) grip strength, (7) intermalleolar straddle and (8) joint tenderness.

The response to each drug is assessed as—

(1) Much worse—20 per cent deterioration
(2) Worse—10 per cent deterioration
(3) No change—5 per cent
(4) Improved—5-10 per cent improvement
(5) Much improved—10 per cent improvement
(6) Completely relieved—Symptoms disappearing and numerical scores namely 1 to 6 have been assigned to each category in the above order. The scores have been tabulated and an analysis of variance table has been prepared.

The effects due to the drugs are found to be highly significant at 1 per cent level of significance. Since there is a significant difference between the 3 drugs, the difference between the individual effects of the 3 drugs is tested adopting a 't' test.

Standard error of the difference between means		—	0·115
t ; placebo—ibuprofen	— $\frac{0{\cdot}490}{0{\cdot}115}$	—	4·3
t ; placebo—indomethacin	— $\frac{0{\cdot}485}{0{\cdot}115}$	—	4·2
t ; indomethacin—ibuprofen	— $\frac{0{\cdot}005}{0{\cdot}115}$	—	0·04

The difference between placebo and ibuprofen and placebo and indomethacin are highly significant, but the difference between indomethacin and ibuprofen is not found to be significant. Comparing the mean values for ibuprofen and indomethacin it is seen that the mean value for ibuprofen is slightly greater than that of indomethacin. Though therefore it may appear that ibuprofen may be experimentally more effective than indomethacin, this difference did not reach the level of significance.

DISCUSSION

Cardoe (1969) compared the effects of 600 mg. of ibuprofen with that of 300 mg. phenylbutazone given daily in 29 patients. Both the drugs produced significant improvement in grip strength joint tenderness and early morning stiffness. The reduction in ESR was more pronounced in the case of ibuprofen. Thompson *et al.* (1968) reported on the treatment of arthritis with ibuprofen. The drug relieved pain and morning stiffness of rheumatoid arthritis. The same authors found a daily dose of 600 mg. ibuprofen superior to 3 g. paracetamol in a controlled study. Gastro-intestinal symptoms were minimal. Chalmers (1969) found that ibuprofen in a daily dose of 600-900 mg. had an effect comparable to that of 3·6 g. of aspirin. Side effects though few included gastro-intestinal upsets and reactivation of peptic ulcer. Boardman *et al.* (1967) found no significant therapeutic effect in 20 patients with rheumatoid arthritis when given in a daily dose of 600-900 mg. Jasani *et al.* (1968) found the analgesic and anti-inflammatory effects of 750 mg. of ibuprofen similar to those of 5 g. of aspirin ; but inferior to that of 15 mg. of prednisolone. Both prednisolone and ibuprofen led to a fall in ESR and a rise in SGOT and SGPT. In this present trial, the result in 24 cases show that ibuprofen in a dose 200 mg. thrice daily for 7 days was significantly better than that of a placebo and the beneficial effect was similar to that of 75 mg. of indomethacin. Side effects were negligible. The rise in SGOT and SGPT observed in some of the cases in all the 3 groups with all the 3 drugs is probably of no serious consequence since there was no other evidence of hepatic dysfunction, the raised levels returned to pre-treatment values when the drugs were stopped.

SUMMARY

The clinical and laboratory findings in 24 patients with rheumatoid arthritis treated with ibuprofen (600 mg./daily), placebo (300 mg. lactose) and indomethacin (75 mg./daily) were studied in a comparative trial of these drugs. Ibuprofen and indomethacin in the doses given had similar beneficial effects. No serious side effects were observed.

ACKNOWLEDGMENT

We thank the Superintendent, Medical College Hospital for permission to conduct the study and publish this report. The drugs in identical capsules were kindly supplied by Dr. P. V. Mesvani.

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4

A Study of Amoebic Liver Abscess

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Amoebic abscess of liver appears in only about 10 per cent of cases of amoebic colitis (Wilmot, 1962). It is reported that carrier state for *Entamoeba histolytica* cyst in the faeces is an important source of liver abscess. Chuttani *et al.* (1961) in survey of medical students found 48 students harbouring *Ent. histolytica,* of which 33 (55·3 per cent) were symptomless. Mazzitelli (1959) and Lupasco *et al.* (1964) reported an appreciable number of symptomless cyst passers. Chuttani *et al.* (1968) screened 3982 subjects from hospital patients and detected *Ent. histolytica* cyst in the stools of 284, of them 193 (67·9 per cent) were symptomless carriers. Despite a prevalent asymptomatic amoebiasis it is not known why only a few develop liver abscess. Many factors like virulence of infection, resistance of the host, diabetes mellitus, alcoholism and malnutrition may play an important role in determining the hepatic involvement.

MATERIAL AND METHOD

Eighty cases with proved amoebic liver abscess were included in this study. Aspiration of the abscess was carried out in 59 cases.

The diagnosis of amoebic liver abscess was established by the presence of one or more of the following factors:

(1) Aspiration of anchovy sauce colour pus which was sterile on bacterial culture.

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(2) Filling defect on liver scan which reverted to normal after specific anti-amoebic treatment.

(3) Hepatomegaly with palpable abscess which responded to specific anti-amoebic treatment.

LABORATORY STUDIES:

Serum bilirubin was estimated by the method of King and Wooton (1956). Total serum protein and albumin was determined by Biuret method (King and Wooton, *loc. cit.*). SGOT and SGPT estimations were carried out according to the method of Reitman and Frankel (1957) and alkaline phosphatase was estimated by the method of King and King (1954).

Indirect haemagglutination test (micro haemagglutination test) was performed with axenic antigen and macro haemagglutination with the AIIMS antigen (Prakash *et al.*, 1969).

OBSERVATIONS

Age and sex incidence—There were 63 males and 17 females. The maximum incidence of the disease was between the age of 21 and 30 years in males and 41 and 50 years in females.

The sex distribution and age group is shown in Table 1.

TABLE 1—SHOWING AGE AND SEX INCIDENCE IN 80 CASES OF AMOEBIC LIVER ABSCESS

Age (years)		No. of patients	Male	Female
11—20	...	7	5	2
21—30	...	29	25	4
31—40	...	19	16	3
41—50	...	16	11	5
51—60	...	7	6	1
61—70	...	1	—	1
71—80	...	1	—	1
Total	...	80	63	17

Clinical features—The onset was acute with high fever and pain in the right hypochondrium in two cases. In 27 cases the onset was with mild fever ranging between 99°F and 101°F associated with vague upper abdominal pain. In the remaining 51 cases, the onset was gradual with vague dull pain in the right hypochondrium with occasional mild fever.

The average duration of illness before reporting to the hospital was 4·2 weeks with a range of 1 to 40 weeks. History of dysentery within last 3 years was obtained from 20 patients. General nutritional status was good in 26 cases and poor in 54 cases. Mild to moderate temperature was present in 69 cases. In 11 cases the temperature was normal. Jaundice of mild to moderate degree was present in 7 cases.

Liver was enlarged in 78 cases. Fifty-seven cases had liver buldge with interocostal tenderness. Right lobe was enlarged in 63 and left in 3 and diffuse enlargement of liver was present in 12 cases. Average size of liver enlargement was 5·9 cm. with a range of 1 to 12 cm. In three cases the liver was firm in consistency.

Major clinical features of the patients are shown in Table 2.

TABLE 2—SHOWING CLINICAL FEATURES

Clinical feature		Number of cases	Percentage
Onset:			
Sudden	..	29	36·3
Gradual	...	51	63·7
Dysentery during past 3 years		20	25·0
Pain:			
Upper abdomen	...	27	33·7
Right hypochondrium	...	53	66·3
Nutritional status:			
Good	...	26	32·5
Poor	...	54	67·5
Fever:			
Mild to moderate	...	69	86·3
No fever	...	11	13·7
Jaundice	...	7	9·0
Liver:			
Buldge	...	57	71·2
Right lobe enlargement	...	63	78·8
Left lobe enlargement	...	3	3·7
Diffuse enlargement	...	12	15·0
Intercostal tenderness	...	57	71·2

Results of investigations—Total leucocyte count was below 5,000/c.mm. in 2, up to 10,000 in 65 and above 10,000/c.mm. in 13 cases. Haemoglobin was below 10 g. per cent in 24 cases and above 10 g. per cent in the remaining 56 cases. ESR was raised in 26 cases.

Stool examination showed *Ent. histolytica* cysts only in 9 cases.

Urine examination showed bile pigment in 5 and increased urobilinogen in 4 cases.

Liver function tests: Serum bilirubin was above

TABLE 3—SHOWING SERUM BILIRUBIN LEVELS IN 80 CASES OF AMOEBIC LIVER ABSCESS

Serum bilirubin in mg. %			No. of cases with percentage
Less than 1	...	...	64 (80%)
1·0—2	...	...	11 (13·75%)
Up to 4	..	...	1 (1·25%)
Up to 6	...	...	1 (1·25%)
Up to 8	...	...	2 (2·50%)
Up to 10	...	...	1 (1·25%)

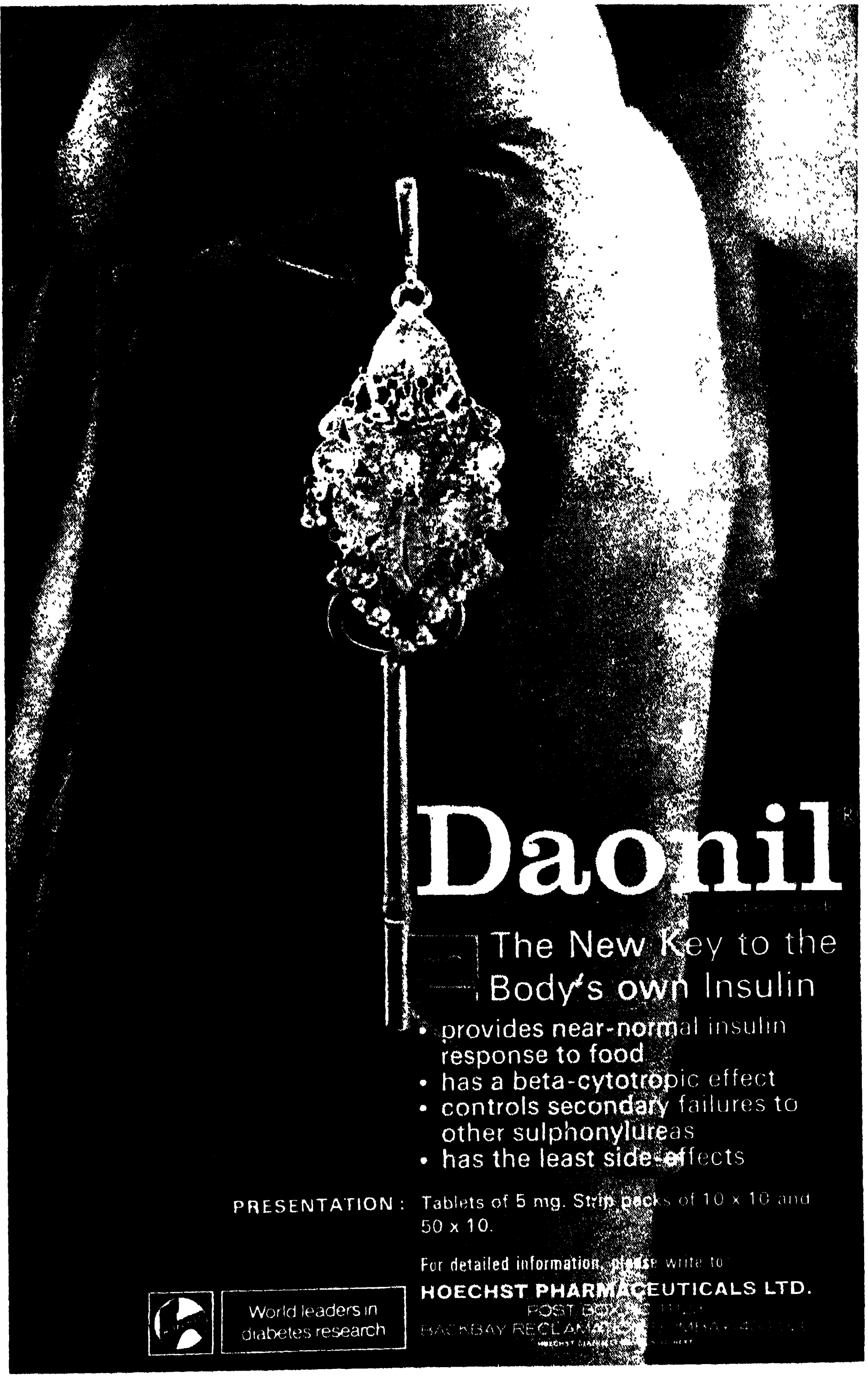

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TABLE 4—SHOWING LIVER FUNCTION TESTS IN 80 CASES OF AMOEBIC LIVER ABSCESS

	Total protein (g. %)	Serum bilirubin (mg. %)	Serum albumin (g. %)	Globulin (g. %)	Alkaline phosphatase (KA Units)	Choles-terol (mg. %)	SGOT (millimol/ml./hour/40°C	SGPT
Range ...	0·3-10	5-7·8	1·7-3·8	2·2-4·7	8-44	90-270	0·6-4·3	0·5-5·7
Average ...	1·4	6·3	3·0	3·4	22	160	2·14	2·12

2 mg. per cent in 5 cases. Range of serum bilirubin is shown in Table 3. Mean serum protein value was 6·3 g. per cent, albumin 3 g. per cent and globulin 3·4 g. per cent. Globulin was increased in 33 cases (above 3·5 g. per cent). Alkaline phosphatase was raised in 56 cases; the mean value being 22 KA units. There was very modest rise of transaminases. SGOT was elevated (above 1·7 millimols/ml./hour/40°C) in 33 cases and SGPT in 29 cases. Serum cholesterol values were less than 150 mg. per cent in 18 cases. Liver function tests are shown in Table 4.

Blood urea was raised in 12 cases.

Pleural effusion was present in 14 cases and dome of the diaphragm was elevated in 49 cases. Pleural reaction was observed in 4 cases.

DISCUSSION

The present study of 80 cases of amoebic liver abscess confirms the earlier report of high prevalence of the disease in India (Reddy and Subramanyam, 1962; Tandon and Rajan, 1966, 1967; Chuttani *et al.*, 1968). It may be stressed that this is despite an intensive and often indiscriminate use of amoebicidal agents in medical practice to treat the colonic amoebiasis. Male to female ratio noticed in the present study was 3·7:1 with maximum incidence of the disease in third decade for males and fifth decade for females. Kini and Mammi (1970) reported male to female ratio of 12:1 which they attributed to low intestinal amoebiasis in female is not borne out by our results. Previous history of dysentery was available in 25 per cent of our cases which compares well with the observations of Sivasankaran *et al.* (1966). The onset was sudden with fever and pain in right hypochondrium in 36 per cent and gradual in onset in 64 per cent of cases. Most interesting feature was the presence of clinical jaundice in 9 per cent with serum bilirubin level above 1 mg. per cent in 20 per cent and above 2 mg. per cent in 7 per cent of cases. Serum bilirubin was between 6-10 mg. per cent in 5 per cent cases. Lamont and Pooler (1958) reported serum bilirubin levels above 0.8 mg. per cent in 10 per cent cases. Salako (1967) found high level in 9·6 per cent cases. Kini and Mammi (*loc. cit.*) noted high incidence of jaundice in 17 per cent cases. Highest incidence of jaundice in amoebic liver abscess (30 per cent) has recently been reported by Datta *et al.* (1971). The jaundice has been considered due to pressure on bile ducts. Recent studies of BSP metabolism in amoebic liver abscess (Datta *et al., loc. cit.*) suggests that jaundice may be due to defect in the transport mechanism of the bilirubin in the liver.

Most of the liver function tests are of no diagnostic value. However, an elevation of alkaline phosphatase in 70 per cent in the present series suggests the diagnostic value of this investigation. This confirms earlier similar suggestions by Viranuvatti *et al.* (1963), Tandon *et al.* (1966), and Salako (*loc. cit.*). The diagnostic value of haemagglutination test has been established by extensive study of Prakash *et al.* (*loc. cit.*). These investigators have demonstrated the superiority of haemagglutination test over reports of other serological tests.

Amoebic abscess of the liver was diagnosted on scanning in 49 of the 62 patients which provided filling defect of "Broad net pattern" (Tandon and Rajan, 1966). Although the filling defect on the liver scan is non-specific finding, the diagnosis of abscess can be very much strengthened by this investigation in a clinically suspected case.

Aspiration of the abscess was done in 63 per cent cases, 38 per cent had aspiration done twice. One patient had 5 aspirations of the abscess.

Rupture of the abscess into the surrounding structures is a serious complication (Alkan *et al.*, 1961). Intraperitoneal rupture occurred in 4 per cent and proved fatal in 1 case. Rupture into lungs and pleura was observed in 14 per cent cases out of which 5 per cent (4 cases) ended fatally.

Total mortality was 6·3 per cent. All were females. Two cases were in 4th decade and 2 in 5th decade and one in 6th decade. Blood urea was above 40 mg. per cent in all fatal cases. No other contributory factors could be ascertained.

Result of the medical treatment was good. Residual enlargement of liver up to 1-5 cm. was still present in 70 per cent cases at the time of discharge,

SUMMARY

The clinical features, and laboratory data in 80 cases of amoebic liver abscess is presented. Male to female ratio was 3·7 : 1. Except general features of poor nutritional status noticed in 67·5 per cent, no other contributory factor like diabetes mellitus or alcoholism was noted in any of the cases. Interesting clinical observations were afebrile clinical presentation in 13·7 per cent, jaundice in 9 per cent and firm hepatomegaly consistent with malignancy in 4 per cent cases. Serum alkaline phosphatase elevation was noted as the most significant abnormality in the liver function test. Diagnostic value of liver scan and haemagglutination test is confirmed. Serious complications included rupture of the abscess into the pleural cavity or lung in 14 per cent of cases and rupture into peritoneal cavity in 4 per cent of cases. Mortality was 6·3 per cent. It needs stress that mean duration after the onset of symptoms before reporting to hospital was 4·2 weeks. In general, the response to specific anti-amoebic therapy was good with resolution of abscess but mild hepatomegaly persisted in a majority of cases after completion of treatment.

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5

Parcentesis in the Management of Acute Abdomen

JOGINDER SINGH*

D. N. BHARDWAJ**

BHOLLA SINGH***

Acute abdomen forms bulk of the emergencies of a general surgeon, often taxing the diagnostic acumen regardless of the experience of the surgeon. Any aid in the avoidance of the diagnostic pitfall is thus welcome. Solomon (quoted by Prout, 1968) first described the technique of abdominal paracentesis more than 60 years ago. Neuhof and Cohen (1926) carried out the first comprehensive study of abdominal paracentesis and described its usefulness in abdominal injuries, acute pancreatitis and peritonitis. The technique, however, did not gain general acceptance because of the fear of injuring abdominal viscera. Numerous studies have been reported of recently, which speak of the usefulness of this procedure. The authors were stimulated to this study when paracentesis was first carried out in a young man aged 22 years who came with history of acute abdominal pain of 2 days' duration and a mass formation in the right iliac fossa. He was treated on expectant lines when it was noticed that the area of dullness on percussion had increased and paracentesis revealed haemorrhagic foul smelling fluid suggestive of gangrenous gut. On laparotomy volvulus of the small gut with gangrenous changes was found, resection of which was followed by recovery of the patient. Since then 40 paracenteses have been performed in 39 cases for varying conditions.

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TECHNIQUE:

A 5 ml. glass syringe fitted with No. 20 Gauge intravenous needle is used to puncture the parietal peritoneum in four abdominal quadrants, in the flanks and selected area of dullness after local anaesthesia. The quadrant is selected according to the site of pathology. In 90 per cent cases positive result was obtained in the right lower quadrant alone. The other quadrants are punctured only in case of a negative result.

The result is indicated as positive when abnormal fluid is aspirated, whatever small in amount, and negative if no or less than 0.5 ml. of clear serous fluid is aspirated. Naked eye examination alone of the nature of the fluid (clear, turbid, purulent, bloody, serosanguineous, bile stained, frank clear bile, gaseous, faeculent or contains food particles) is relied upon to arrive at a conclusion. Amylase estimation was done only in 2 cases, suspected of acute pancreatitis.

DISCUSSION

Perforated viscus—24 out of 39 cases where paracentesis was performed, comprised perforated viscus. Of the 24 paracenteses, 18 paracenteses revealed frank pus and these were diagnosed as peritonitis due to burst appendix. Relatively fit patients were opened by a mid-line incision for abdominal toilet and bad risks were just drained under local anaesthesia. The diagnosis was incorrect in only 2 instances where duodenal ulcer perforations were found, though clinically or radiologically there was no clue to the diagnosis preoperatively. Paracenteses were negative in 2 cases and the patients recovered on expectant treatment, being regarded as forms of peritonitis of less severity. Paracentesis fluid revealed frank bile in 2 cases and were correctly related to gall-bladder perforations at operation. Before paracentesis, diagnosis was quite uncertain and gall bladder disease was not thought of. One paracentesis revealed bile stained pus, the patient was in his 2nd week of febrile illness and correctly revealed terminal ileum perforation due to typhoid fever. One paracentesis was false negative, since no fluid was aspirated but because of increasing rigidity laparotomy was done, and this again turned out as typhoid ulcer perforation in the terminal ileum. At operation pus was found in the pelvis and in loculated form between loops of gut disposed mostly centrally and had thus evaded the needle. Perforated viscus gave a high positive rate of 95 per cent, giving a coherent clue to the diagnosis and a great help in their management. Similar high positive rate in perforations have been given by Baker *et al.* (1966). On the other hand negative paracentesis does not exclude a serious catastrophe as in the case of typhoid ulcer perforation illustrated. Baker *et al.* (*loc. cit.*) and Prout (1968) stressed that negative paracentesis has no value.

Acute pancreatitis—2 cases suspected of acute pancreatitis yielded sero-sanguineous fluid with amylase level of 500 and 1000 Somogyi units. Corresponding serum level was 400 units in one and was not done in the other. Both cases responded to expectant treatment. Keith *et al.* (1950) found high amylase levels in paracentesis fluid and it had remained higher for 2 to 3 days more than the serum level. However, serum amylase levels may only be slightly raised (Howard, 1949) and high levels in paracentesis fluid may also be met with in perforated ulcer (Amerson *et al.*, 1958).

Traumatic cases—Paracentesis done in 3 cases of blunt injury abdomen revealed frank blood and in addition food particles in one. There was injury to the spleen, the liver and the gut respectively. One case of penetrating injury of the chest on the left side above the level of the nipple was being managed expectantly when he developed increasing rigidity and tenderness in the left upper abdomen. Paracentesis showed frank blood and at operation the spleen was found to be involved by the stab.

Williams and Zollinger (1959) had empoyed paracentesis extensively in the management of traumatic cases. Usefulness has been appreciated by Prout (*loc. cit.*) and traumatic cases comprised the majority in the study of paracentesis by Gjessing *et al.* (1972) finding it useful in their management.

Strangulation obstruction—3 cases of acute abdomen of obscure nature revealed foul smelling frank haemorrhagic fluid and the diagnosis of strangulation obstruction was made. In one there was volvulus of the small gut and that of the caecum in the other with gangrenous changes. Both survived the operation. In the third, mesenteric infarction was detected at operation with widespread gangrene of the small gut and was lost. The authors feel highly gratified and regard paracentesis as solely responsible in initiating the diagnosis. Their first case of paracentesis had stimulated the authors, to pursue the study.

Postoperative cases—There were 3 cases of this group. In 2 cases, stormy postoperative period ensued gall bladder procedures and paracentesis showed bile and pus and these collections were then drained. The third patient had been earlier operated for typhoid ulcer perforation, developed huge distension of the abdomen with respiratory difficulty and was toxic. Paracentesis revealed gas under tension which was let out and later purulent material could be removed. The patient was drained through a stab incision under local anaesthesia and made an unexpected recovery. It is assumed, there was a leakage from the sutured site.

Simple mechanical obstruction—Paracentesis was not intended in these cases but was done because of the obscurity of the diagnosis. In all the 3 cases, penetration of the gut occurred, since paracentesis revealed liquid faeculent odourous material. No complication ensued. One recovered on expectant therapy. In 2 laparotomy was performed for the mechanical obstruction but did not reveal any leakage or even puncture sites.

Similar instances where penetration of the gut had occurred on paracentesis without any complication have been reported by Williams and Zollinger (*loc. cit.*); Giacobine and Siler (1960); Baker *et al.* (*loc. cit.*) and Prout (*loc. cit.*) This is attributed to the self-sealing action of the gut wall.

SUMMARY AND CONCLUSION

The role of paracentesis in the diagnosis and management of acute abdominal conditions has been studied. 40 paracenteses were done in 39 cases.

There was 95 per cent positive results in cases of perforated viscus.

Paracentesis of frank bile led to the diagnosis of leakage from the biliary tract not diagnosed clinically or radiologically.

It has aided in the management of acute pancreatitis, traumatic cases and postoperative cases.

Paracentesis initated the diagnosis of internal strangulation obstruction out of uncertainty.

Paracentesis is a safe simple and rewarding procedure and so a plea is made for its increased acceptance in clinical practice.

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PRACTITIONERS' SERIES

Factors Influencing Prognosis in Carcinoma of Breast

K. M. CHITANIA*

A vast amount of literature has emanated regarding the multitudes of factors discussing the carcinoma of breast in recent years.

The cancer of the breast usually kills its victim not by its local spread but by the general dissemination. The main problem lies not only in the clinical form of the disease but also in the precancerous subclinical form, its susceptibility to certain factors in such a state, its evolution in course of time and the guidelines adopted in its management. Thus the prognosis of carcinoma of breast can be improved by fuller undertaking of the various factors influencing the course of the disease in clinical and subclinical stage. These in general are : age, pathology, pregnancy and parity, heredity, clinical presentation, steroidal metabolic studies, immunity factor, treatments adopted and other ill understood factors.

AGE

Although carcinoma of breast commonly occurs in women past middle age, the disease is governed by the sexual status rather than age. Menopausal women have a better survival rate than the premenopausal ones. Castrated or ovarian irradiated patients have half the incidence of carcinoma of breast developing in them as compared to the normal ones, and the survival rate is also better. The prognosis with hormone therapy is also better in postmenopausal women.

The two great stages in the sexual life of a female also weigh heavily in the development of the disease, i.e., menarche and menopause. Restrospective studies have suggested that the different factors influencing the sexual life of the female at these stages contribute to the development of two different growth rates of future carcinoma of breast. These different growths disseminate from their primary inception as different types of malignancies and can kill their victims.

PATHOLOGY

This factor plays a major role in the prognosis, although it is still not fully understood. Even though one encounters adenocarcinoma of the breast as the commonest form of carcinoma, the inherent aggressiveness of the tumour, vascularity of the breast and the immunological response of the host determine the final outcome of the disease pathologically, e.g., schirrous, atrophic schirrous, encephaloid or inflammatory type, etc.

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* M.B.B.S., F.R.C.S.

A study of the growth rate and the size of the primary when first encountered gives an idea of the pathogenesis of the disease, i.e., as to when dissemination occurred. Clinical and pathological studies of these factors reveal two different patterns of growth rates or one with changing pattern of growth rate. These growth rates or the "lines of development, or fits and starts", of the primary and the metastatic growth of the disease are dependent upon the least differentiated cells which metastasise. Thus the secondary deposits grow not only at a fast rate but also at a quite early stage of the disease. This development remains quiscent and in a state of controlled carcinomatosis. What includes this controlled state into a state of uncontrolled form is still unknown. Irradiation in some form can affect state.

Histologically this is evinced by sudden alteration of the morphological pathway of the differentiated cell, leading to a slow growing tumour into a fast one, although experimental evidence refutes such claims.

Lactational carcinoma of the breast have the worst prognosis, while the atrophic schirrous form has the best one, probably because of the vascularity and the functional activity of the acini of the breast.

PREGNANCY AND PARITY

Cancer of the breast when occurs concurrently with pregnancy has a better prognosis, especially if it occurs in the third trimester. Similarly it is better when carcinoma occurs in the first half of pregnancy as compared to the matched controls of the premenopausal patients. Survival rates of 75 per cent have been noted in patients with breast carcinoma whose pregnancy followed mastectomy.

As regards pariety, the prognosis is more favourable in cases who were multiparous. The incidence of cancer of the breast also is less as compared to the nulliparous ones. This has a direct bearing on the normal physiological activity of the breast.

HEREDITY

Inheritence of the susceptibility of carcinoma of breast is postulated on experimental animals and also on the strong predisposition of the disease in certain families.

CLINICAL PRESENTATION

The disease and the metastatic spread by the blood stream have commenced many years previous to the clinical appearance of the disease. The disease progresses relentlessly even though different combinations of therapy are instituted as the pretherapeutic seedlings in their metastatic sites continue to enlarge.

The standard T N M classification adopted by the International Union against Cancer in 1960 is based on clinical judgment, as no correlation with the exact pathological state of the disease, as the spread has already started long before the clinical menifestation of the disease. This is evident from the fact that the internal mammary lymph nodes are involved in 28 per cent of all clinical cases, and that 37 per cent of all cases having the primary in the medial half of the breast. The clinical aberration regarding the detection of even the axillary and supraclavicular group of glands by different clinicians makes the standardisation of the T N M classification untenable. In the subclinical form or the controlled carcinomatosis, there is a state of prolonged quiscence rather than a short regression.

Regarding the secondary deposits, the axillary nodes once metastasised diminish the survival rate by half. The blood borne metastases are not so important for survival as compared to the nodal involvement, as there is controlled carcinomatosis with subclinical dissemination of cancer of cells induced by immune reaction transferred by lymphocytes to thymus, spleen, etc., forming antibodies. This explains a 15-year survival rate more in Stage II as compared to a Stage I of the T N M classification. Similar is the case with the medullary form of the disease. In advanced carcinoma of the breast with metastasis in glands or distant places there is no place for a standard approach to the problem.

STEROIDAL METABOLIC STUDIES

Steroids have an important bearing on diagnosis, prognosis and completeness of operative treatment or chemotherapy in carcinoma of breast. It has been found that women fall into two groups, depending upon the metabolite excretion in their urine of androgenic and oestrogenic hormones. Patients with low levels of the androgenic metabolite (aetiocholanalone) fare badly as compred to these with low levels of 17 OH corticosteroids, i.e., they are negative discriminants, and so chances of developing carcinoma are higher in later life. A subclinical population of breast cancer likely to develop the disease could be found out, and then to alter their hormonal environment at that early stage, and so improve the prognosis.

The steroidal abnormality might have preceded the clinical appearance of carcinoma of breast and might have caused it. These abnormalities are multidirectional. In postmenopausal women oestrogen stimulated vaginal smears, high excretion of oestradiol and obesity and hypertension help in detecting the subpopulation of cancer of the breast.

The induced endocrinal imbalance has substantiated androgenic therapy in susceptible individuals. The clinical response of this therapy is related to the urinary androgenic levels. The majority of the clinicians take the view of cautious optimism in pursuance of this experimental but a potentially far reaching field.

IMMUNITY FACTOR

The developmental stages of the tumour from its inception, passing into subclinical controlled carcinomatosis into the clinical stages and its subsequent growth into the uncontrolled carcinomatosis, present a host-tissue reaction of an immunological type. The blood borne dissemination in the subclinical stage induce an immunity reaction of antigen-antibody type, being transferred by lymphocytes to thymus, spleen, etc. These antibodies prevent both primary and secondaries from growing uncontrollably. This controlled carcinomatosis becomes uncontrolled when the immunity breaks down. Although irradiation is supposed to effect such a change, the exact cause is still unknown. The immunity factor also explains the response to various treatments to the disease. Thus it explains the response of node positive and node negative cases treated with radiotherapy. The help by radiotherapy in patients over 65 years is also explained, as the immunity reaction fades with increasing age. The sudden development of metastatic deposit many years after the treatments is also so explained. Similarly the spread to the regional and distant lymph nodes, and not the local seedlings is due to the immune reaction. The multicentric origin and also chances of development of bilateral tumours are due to the susceptibility of host tissue to the same environment. Once the immunity breaks, the treatment by one or the other methods makes no difference in the course of the disease and the final outcome.

Partial loss of immunity will be exacerbated by radiation as part of the initial treatment, and results in an increased metastasis and falls in the survival rate. This factor goes strongly against the institution of radiotherapy in postoperated cases with negative nodes. Spontaneous regression of certain cases of carcinoma of breast, though ill understood could be very well be explained by immunological status of the individual. The disquieting situation of identical outcome by policy of noninterference to supraradical mastectomy with or without pre-or postoperative radiotherapy, is thus the direct outcome of this immunological status of the individual. The same also explains the fact that 15 years survival rate is more in Stage II than Stage I. In case of medullary carcinoma the host resistance is manifested by lymphocytic infiltration of the tumour histology.

The aim thus should be to control the disease and maintenance enhancement of host resistance. Attempts at increasing the host resistance have been so far unsuccessful. Administration of B.C.G. vaccines and other stimulants for increasing the antibody titre have not been fruitful. As no known antigen specific of tumour cell have been isolated, the immunological approach, though valid, is still very experimental.

TREATMENTS ADOPTED

Ever since the inception of Halstead's radical mastectomy so as to remove the diseased breast and draining lymphatics and the lymph nodes, a flood of different ideas have been put forward in the management of carcinoma of the breast. Workers in this field vary in their belief from 'leave it alone' to ultraradical mastectomies with or without radiotherapy and chemotherapy. Only recently, with the emergence of a more rational approach to the problem, a guide line has been appreciated.

One of the fundamental argument raised from this situation is whether the disease of carcinoma of breast is curable or not. The five-year survival rate, as applied to most of the diseases of similar nature, is not applicable here. One has to reach a sad conclusion that the disease is in fact an incurable one, and that the disease disseminates long before a curative attempt is undertaken. Instead of a cure of the disease, one should consider survival plus recurrence free period as the criterion in the management of this dreadful disease.

As surgery or radiotherapy has made no difference in the course of the disease, a simple form of surgery is advised to remove the local disease.

Any attempt at radical surgery in cases of Stage III or IV is useless if not harmful. Only hormone therapy, endocrinal ablative surgery or chemotherapy have some place for palliation. The concept of endocrinal therapy is based on the metabolic studies and the hormone dependence of half the number of tumours of the breast In general the response to hormone therapy is greater the more remote a woman is postmenopausally.

ILL UNDERSTOOD FACTORS

Slow growing tumours have better prognosis than fast growing ones. Cytotoxic and palliative radiotherapy although do not materially affect the outcome of the disease, in few cases have regressed the tumour growth remarkably, looking like apparent cures.

SUMMARY

Presymptomatic treatment and diagnosis have not made much material change in the outcome of the disease. The duration of illness in a particular Stage or Grade has not altered by conventional line of treatment. Immunological approach is still in experimental stage, although some hope is raised from that direction. Host-tissue symbiosis disease has not yet reached sufficient strides to reject a radical approach in carcinoma therapy. Proper genetic mating to diminish the carcinoma susceptibility has not reached beyond experimental stage. Excessive surgery or radiotherapy do not help to improve the survival rates, on the contrary they increase the morbidity. Modifying hormonal or immunological status of an individual by various therapies available at the moment are perhaps the best hopes for preventing and ameliorating the disease in the subclinical stage.

CASE NOTES

I

Hyperosmolar Non-Ketotic Diabetic Coma

V. P. BEDI*, M. KOCHHAR**

Since the publication of the paper by Sament and Schwartz (1957) there has been a spate of publications of case reports (Lucas *et al.*, 1963 ; Danowski and Nebarro, 1965 ; DiBendetto *et al.*, 1965 ; Halmos *et al.*, 1966 ; Martin, 1968 ; Kumar, 1968 ; Hayes and Woods, 1968 ; Macaulay, 1971 ; Collins and Harris, 1971), reviews (Danowski and Nebarro, *loc. cit.* ; DiBendetto *et al.*, *loc. cit.* ; Schwartz and Apfelbaum, 1965 ; Solvsteen *et al.*, 1968 ; McCurdy, 1970 ; Danowski, 1971) and underlying pathophysiological mechanisms (Jackson and Forman, 1966 ; Johnson *et al.*, 1969 ; Oakes *et al.*, 1969 ; Vinik *et al.*, 1970 ; Jackson, 1971 ; Arief and Caroll, 1971 ; Gierch *et al.*, 1970 and 1971). A fair degree of unanimity has developed as regards the management of such cases over the years (Johnson *et al.*, *loc. cit.* ; Solvsteen *et al.*, *loc. cit.* ; Jackson and Forman, *loc. cit.*; Gierch *et al.*, *loc. cit.*). The mortality is high (40 per cent to 50 per cent) but is likely to improve with greater awareness of the condition and early and prompt treatment of such cases.

Similar cases have been known and described in the surgical literature (Rosenburg *et al.*, 1965 ; Boyer, 1967 ; Oakes *et al.*, *loc. cit.*) occurring mostly after burns. Recently, Ashworth *et al.* (1968) and Oakes *et al* (*loc. cit.*) have described the importance of this condition in surgical patients.

Below is described a patient who slipped into hyperosmolar non-ketotic coma without regaining consciousness after a major surgical procedure. We could find no mention in the literature where a surgical procedure has been incriminated as a precipitating factor.

CASE REPORT

Mrs. V. W., 37 years, gravida 8th, was admitted on 30-11-1971 at 8 A.M. for the first time in our hospital. She was under the antenatal care of some other institution. Records with the patient showed that she developed glycosuria during 3-4th month of the current pregnancy which disappeared later. Glycosuria was not investigated any further. The patient had a history of previous big babies and the last child was a stillbirth four years back.

At full term she was admitted in the other institution but she got herself discharged from there after two days and was admitted in a private nursing home. Here she stayed for another two days and was given oxytocin in 5 per cent glucose to induce labour. She was referred to our hospital for post-maturity and big baby and was admitted on 30-11-1971.

On examination the patient was found to be obese and the uterus was enlarged to account for full term pregnancy. The head was presenting and not engaged. Foetal heart sounds were good. The baby seemed to be big. Pelvic examination showed the cervix to be 2/5th dilated and no obvious cephalopelvic disproportion. Her blood pressure was normal and haemoglobin was 10 g. per 100 ml. of blood.

Management -Oxytocin in 5 per cent glucose was started. Foetal heart sounds became irregular. A lower segment caesarian section was done at 12-45 P.M. for foetal distress (using 0·25 g. of pentothal and gas and oxygen) and a live female child weighing 3 kg. and 350 g. was delivered. The operation itself was fairly simple and completed within 45 minutes and without any untoward incident during the operation. Her pre-operative urine examination was missed.

The patient failed to gain consciousness till 3·00 P.M. Examination at this stage showed her pulse rate to be 100 per minute and regular, blood pressure 120/70 mm. Hg, breathing shallow and the patient deeply comatosed with sluggish corneal reflex and absent tendon jerks. No other neurological abnormality could be detected. Other causes such as cerebrovascular accidents, overdosage with the drugs, jaundice and hypersensitivity to the drugs were thought of and excluded. A urinary catheter passed at this stage brought out 1000 ml. of pale yellow urine. The urine gave a brick-red reduction with Benedict's solution and was negative for ketone bodies. Blood sugar was 460 mg. per 100 ml. of blood at this stage. We gave 120 units of soluble insulin intravenously and 140 units of soluble insulin intramuscularly with about 4 litres of fluids consisting of normal saline 1000 ml., glucose saline 1000 ml. and glucose 5 per cent, 2000 ml. in the first 6 hours. The patient started regaining consciousness after about 10 hours of stopping general anaesthesia and became delirious and restless in the recovery period. She regained

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full consciousness 24 hours after stopping the general anaesthesia. No more insulin was given arter 10 P.M. All her subsequent urine examinations were normal. She stayed in the hospital for over a period of one month and at no stage she had glycosuria or raised blood sugar level and did not need any insulin at any time.

COMMENTS AND DISCUSSION

Clinical features - Most of the cases, as described in the literature, occurred in the elderly (50 to 70 years) with preponderance in the females in the ratio of 2:1 (Halmos *et al., loc. cit.*). Vinik *et al.* (*loc. cit.*) gave a wider range of occurrence as 16 to 70 years, though the cases occurring in early childhood (Ruben *et al.*, 1969) and a case occurring in a 18-month-old child (Ehrlich and Bains, 1967) have also been described. In 1/3 of the cases there is a history of maturity onset type of diabetes in the recent past while in the remaining 2/3 of the cases no such history may be available (Gierch *et al., loc. cit.*). The onset in the majority of the cases is insidious with polyurea, polydipsia extending over a few days and the patient becoming confused, disoriented and finally slipping into coma, though not invariably, the duration of symptoms extending between one day to two weeks (Vinik *et al., loc. cit.*). Wide range of neurological manifestations, besides confusion, stupor and coma, have been recorded and these include focal and generalised seizures (Maccario *et al.*, 1965; Daniels *et al.*, 1969) and varying degrees of paresis, hemiplegia, quadriplegia, etc. (Dibendetto *et al., loc. cit.*; Jackson and Forman, *loc. cit.*). The most useful pointer to the diagnosis in such cases is the absence of keto-acidoses, deep Kussmaul type of acidotic breathing and acetone smell in the breath in the presence of glycosuria and high blood sugar level.

The real interest during the past few years has been the recognition of more and more precipitating factors and these include drugs, high carbohydrate intake and many clinical conditions. Among the drugs which have been implicated are glucocorticoid therapy, thiazide group of diuretics and ethycranyic acid (Boyer, *loc. cit.*; Solvsteen *et al., loc. cit.*), intravenous dilantin (Goldberg and Sanbar, 1969) and corticoid and immunosuppressive therapy (Spenney *et al.*, 1969). High carbohydrate intake has been blamed by many (DiBendetto *et al., loc. cit.*; Solvsteen *et al., loc. cit.*; Macaulay, *loc. cit.*) even a non-sugar like sorbitol in peritoneal dialysate (Raja *et al.*, 1970) has been known to precipitate this condition. Many other clinical conditions are known to be associated with and have been blamed to precipitate hyperosmolar non-ketotic coma, and those mentioned in the literature are infections, sepsis, renal conditions, congestive heart failure, heart stroke, myocardial infarction, pancreatitis, etc.

The present case followed immediately after caesarian section. The diagnosis was considered when the patient failed to regain consciousness three hours after stopping the general anaesthesia and the coma went on becoming more and more deeper. At this stage her urine examination gave brick red reduction with Benedict's solution and was negative for ketone bodies.

The signs and symptoms in this condition are believed to be due to hyperosmolarity of extracellular fluid giving rise to intracellular dehydration of the cells of the central nervous system.

Hyperosmolarity itself is mainly due to hyperglycaemia and dehydration and to some extent due to hypernatraemia and high blood urea in the later stages.

Stress from any cause acts in two ways. Stress initially increases the endogenous catecholamines secretion which further diminishes the secretion of insulin from beta cells of the pancreas and in later stages it increases the secretion of corticoids which may further blunt the hypoglycaemic action of insulin. Probably the stress of operation and anaesthesia combined with dehydration produced by inadvertent restriction of water intake in this patient, who probably, already was suffering from latent diabetes, precipitated the coma.

Hyperglycaemia, however produced, further exhausts the beta cells of the pancreas already producing insufficient insulin and further accentuates the hyperglycaemia. Blood sugar values as high as 2200 mg. per 100 ml. of blood and as low as 460 mg. per 100 ml. of blood have been recorded in the literature (DiBendetto *et al., loc. cit.*). The blood sugar in the present case was 460 mg. per 100 ml. of blood.

As excessive osmotic diuresis continues there is further dehydration and hypovolaemia and ultimately circulatory collapse follows in the later stages. This adversely affects renal function and blood urea may rise which, in very late stages, may contribute further to hyperosmolarity.

Hyperosmolarity, thus produced, causes withdrawal of fluids from inside the cells. This intracellular dehydration of central nervous system cells is believed to be the cause of all neurological manifestations.

Hyperosmolarity also causes increase in the viscosity of blood and slowing of the circulation. Both these factors increase the tendency of intravascular clotting which may further be accentuated in the atherosclerotic vessels in the elderly (Whelton *et al.*, 1971).

The absence of keto-acidosis has been a subject matter of much discussion. The most accepted view till now has been (Johnson *et al., loc cit.*; DiBendetto *et al., loc. cit.*) that there is a small amount of insulin circulating in the blood which causes hyperglycaemia but is not sufficient enough to prevent keto-acidosis. As a matter of fact a very small amount of insuin is required to prevent keto-acidosis. It has roughly been calculated that 1/10th of the insulin, required to prevent hyperglycaemia, is required to prevent keto-acidosis. Further, hyperglycaemia (DiBendetto *et al., loc. cit.*) and dehydration (Johnson *et al., loc. cit.*) in themselves may be antiketogenic. In recent years more and more emphasis is being laid on fat metabolism to explain keto-acidosis. Seftel *et al.* (1967) found very high levels of free fatty acids in the blood and suggested that there is a block in the uptake and degradation of free fatty acid by the liver. Arief and Carroll (*loc. cit.*) found lower levels of free fatty acid and attributed this to a low level of circulating insulin in the blood inhibiting lipolysis. Gierch *et al.* (1971) found low levels of both free fatty acid and lipolytic hormones i.e., cortisol and growth hormone in the blood of these cases. They suggested that low levels of these lipolytic hormones inhibited free fatty acid formation in non-ketotic coma.

Mortality—Mortality, as noted in the literature, is high in the vicinity of 40 to 50 per cent (DiBendetto *et al., loc. cit.;* Solvsteen *et al., loc. cit.*) but this is likely to improve with greater awareness of the condition, e.g., early diagnosis, better understanding of the underlying pathophysiological mechanisms and prompt management of the patients. Gierch *et al.* (1970, 1971) recorded a mortality of 20 per cent in their cases.

Management—The proper management of these cases hinges upon the administration of the amount of correct fluid to reduce the hyperosmolarity and meeting the insulin requirement, both of which may be enormous in a few cases. There appears to be a fair degree of unanimity on the choice of correct fluid which now is believed to be hypotonic saline, 0·45 per cent (DiBendetto *et al., loc. cit.;* Solvsteen *et al., loc. cit.;* Lucas *et al., loc. cit.;* Gierch *et al., loc. cit.*).

Enormous amounts of the fluid may be required. Lucas *et al.* (*loc cit.*) used 17 litres of fluid in 12 hours in one of his cases though the individual requirement may depend on the degree of dehydration. Further, infusion should be rapid as the movement of water inside the dehydrated cells may further deplete the extracellular fluid, and further cause hypovolaemia. Another point that needs mention is that hypotonic saline should be replaced by isotonic dextrose as soon as blood sugar levels return to normal values and nasogastric feeding should be started as soon as possible.

Treatment of hyperglycaemia may need generous use of insulin though Hayes and Woods (*loc. cit.*) claimed that none was required in their case. Since hyperglycaemia is one factor, albeit an important one contributing to hyperosmolarity, its early correction should be the prime aim in the management of such cases. To start with, 50 units of soluble insulin are given intravenously and 50 units intramuscularly. Subsequent doses will depend on the blood sugar estimations done at hourly intervals. High doses of insulin in the presence of hyperglycaemia will induce potassium to move inside the cells and this may further accentuate extracellular hypokalaemia. The requirement of potassium should be monitored and adjusted accordingly.

SUMMARY

A case of hyperosmolar non-ketotic coma is described when the patient, probably suffering from latent diabetes, slipped into coma after a surgical procedure (caesarian section) without regaining consciousness after general anaesthesia. Inadvertent restriction of water coupled with the stress of the operation and anaesthesia probably precipitated the coma in this case. The literature is briefly reviewed and broad outlines of management of such cases are discussed.

ACKNOWLEDGMENT

Syntocinon (Sandoz) brand of oxytocin was used.

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2

Clinical Tuberculoma of Pons Presenting as Foville's Syndrome

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The incidence of tuberculoma of the brain has been found to be significantly high in various parts of India (Ramamurthi and Varandarajan, 1961 ; Dastur and Desai, 1965 ; Dastur *et al.*, 1968). This granuloma may involve any part of the brain but occurs more often in the infratentorial portion. Depending upon its location it may produce various combinations of signs and symptoms. The present case had all the characteristic features of Foville's syndrome, which is an unusual and uncommon clinical presentation. There was ipsilateral lower motor neurone type of facial palsy, an ipsilateral paralysis of lateral rectus and lateral gaze and a contralateral hemiplegia with impairment of proprioceptive and tactile sensations. This syndrome is caused by a lesion in the dorsocaudal part of the pons by involving the root fibres of the facial nerve, the abducent nucleus, the vestibular fibres coursing through the abducent nucleus and areas adjacent to the contralateral medial longitudinal fasciculus, the pyramidal fibres and medial leminiscus

CASE REPORT

A. S., 25 years, Hindu, male, was admitted to the Hospital on 4-8-1970 with the history of progressive weakness of left upper and lower limbs for 4 months, diplopia on right lateral gaze since one month and watering from the right eye since 15 days. There was no history of fever, cough, night sweats, diminished vision, headache, vomiting or convulsions. On examination, the patient looked slightly emaciated and was fully conscious with normal mental functions. Fundi were normal.

Other neurological findings were: Right lateral gaze palsy, right lateral rectus paralysis, right sided facial palsy of lower motor neurone type, left sided paralysis of upper and lower limbs with spasticity, exaggerrated deep tendon reflexes, and an extensor plantar response and impairment of joint position, vibration and tactile sensations on the left side.

Investigations Blood: (a) E.S.R.—18 mm. in first hour (Westergren method). (b) Total leucocyte count · 4800/c.mm. with polymorphs—64 per cent, lymphocytes—24 per cent, monocytes—10 per cent and eosinophils—2 per cent. (c) Haemoglobin—10 g. per cent.

Urine: Albumin—nil, sugar—nil and microscopic examination revealed no abnormality.

Blood for Kahn test—negative.

Lumbar puncture: C.S.F. was clear with a pressure of 120 mm. of water, cell—4-5 lymphocytes/c.mm., proteins —42·5 mg. per cent, chloride—702·8 mg. per cent, sugar —37·9 mg. per cent and CSF for Kahn test—negative.

X-ray of chest—N.A.D., x-ray skull—N.A.D. and retrograde brachial-vertebral angiography was unsuccessful (not repeated because the patient started showing improvement with antituberculous chemotherapy.

Treatment—The treatment adopted in this case was as follows: Injection streptomycin 1 g. daily i.m. for 3 months together with isoniazid 300 mg. daily. He was also given physiotherapy at the same time.

With the above regime the patient started showing improvements within 2-3 weeks and was symptom-free at the end of 3 months, but a few abnormal signs persisted. On subsequent examination during follow-up there was no abnormality.

DISCUSSION

Tuberculoma is one of the commonest intracranial space occupying lesions in our country, next in frequency to gliomas (Dastur *et al.*, *loc. cit.*). Out of a total of 373 verified cases of space occupying lesions 35·5 per cent were tuberculomas in a study by Dastur and Desai (*loc. cit.*), 21·5 per cent in a later report by Dastur *et al.* (*loc. cit.*), 18 per cent in the series of Sinh *et al.* (1968) and 19·4 per cent in the study of Ramamurthi and Varandarajan (*loc. cit.*). The incidence reported from Europe and North America is comparatively much lower now, but was high in the past. Garland and Armitage (1933) found tuberculoma of the brain in 34 per cent cases in an analysis of *post mortem* material of the period 1910-1931. Asenjo *et al.* (1951) from Chile reported tuberculoma in 15·9 per cent cases in an analysis of verified brain tumours, and Arseni (1958) from Rumania reported an incidence of 7·3 per cent.

Tuberculomas were found to occur more often in females, and the age of maximum incidence was below 25 years. The average age of a patient with tuberculoma is about 14·7 years (Dastur *et al.*, *loc. cit.*). These lesions are more commonly located in the infratentorial region. Nearly 52 per cent of all tuberculomas and 63 per cent of those in children occur in the infratentorial region, cerebellum being the most common site (Dastur *et al.*, *loc. cit.*). The incidence of brain stem tuberculoma reported by Arseni (*loc. cit.*) was 1·5 per cent, and by Dastur *et al.* (*loc. cit.*) 4·1 per cent, out of a total of 195 tuberculomas reported. The anatomical diagnosis in an unoperated case is based on the focal signs, while the aetiological diagnosis is largely presumptive. Constitutional symptoms like fever and loss of weight are of infrequent occurrence, as was seen in the present case and are therefore of not much significance in making the diagnosis of a tuberculoma. The presence of tuberculosis elsewhere in the body makes it more likely that the intracranial lesion is also of the same nature, but at times intracranial tuberculomas have been diagnosed and detected *post mortem* in cases who had no other evidence of tuberculosis in the body. There was, however, no evidence of active tuberculosis in the lungs or in any other place in the present case. ESR may be elevated and many a times this elevation is marginal as is evident from

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this case This observation also, therefore, is not of much diagnostic help.

In the management of tuberculomas, chemotherapy has considerably improved the results obtained after surgery and has also provided a means of effective conservative therapy in selected cases e.g., when the location of the tuberculoma is in the surgically inaccessible site or in cases who decline surgery for some reason or other. In the present case since the tuberculoma was situated in the pons which is a surgically inaccessible site, it was decided to manage the patient with chemotherapy, with which he showed remarkable improvement. It would, therefore, seem reasonable to suggest that if a patient in our country presents with the clinical features of progressive brain stem pathology suggesting the diagnosis of space occupying lesion, it would be desirable to give the patient the benefit of doubt by giving antituberculous chemotherapy on the assumption of its being a tuberculoma.

SUMMARY AND CONCLUSION

A case of Foville's syndrome due to pontine tuberculoma, successfully treated with antituberculosis drugs, is reported to emphasise the point that in all those cases of space occupying lesion in the brain which are situated in sites inaccessible to surgery (e.g., the brain stem) or occasionally, when a patient declines surgery, antituberculosis drugs should be given on the assumption of these being tuberculomas in view of their frequency of incidence in this country. There is a lot of justification in giving these patient the benefit of doubt for a potentially treatable condition. The present case report illustrates the soundness of this statement.

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Isonex (Dumex) brand of isoniazid was used.

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3

Osteoid Osteoma

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The term osteoid osteoma was first introduced by Jaffe (1935) who reported 5 cases to describe a group of bone lesions that microscopically consisted of a core or nidus of osteoid tissue and atypical bone. Such cases had previously been wrongly classified as cortical bone abscess. Since then numerous reports have been published from time to time and unquestionably the clinical, radiological and structural features when taken together are sufficiently specific to distinguish it as a separate entity (Evans, 1966).

CASE REPORT

H. C., aged 27 years, male (B.H.T. No. 494 E) had an injury over the right medial malleolus in 1968 and the patient complained of pain since then. He had another injury on 15-1-1970 when there was a lacerated wound over the right medial malleolus, but no fracture and it was stitched. The pain was markedly increased after this injury and it now became constant and boring in character, worse at night and at times severe. Slightest touch of clothes over the right medial malleolus caused the shooting pain. This pain was relieved on administration of acetylsalicylic acid. He also noticed a swelling over the medial malleolus after this injury and he started limping. Examination revealed a palpable thickening and tenderness over the whole of right medial malleolus but it was attributed to the recent injury. There was one inch wasting of the right calf muscle. Regional lymph nodes were not enlarged. Osteoid osteoma was suspected.

Investigation — X-ray showed a small radio-opaque nodule 5 mm.×4 mm. in size within the cortex of the right medial malleolus. The characteristic radiolucent central nidus could not be demonstrated in this case

A diagnosis of osteoid osteoma was made and the patient was operated upon.

Postoperative x-ray on the table showed complete disappearance of the tumour..

A block of about 2 cm.×2 cm. bone was excised and sent for histopathology. The slide showed that the tissue was made up of confusedly interwoven network of small, irregular, thin, uneven and unequally calcified osteoid trabeculae, some undergoing conversion into atypical bone rimmed by osteoid tissue and osteogenic connective tissue. At other places the trabeculae appeared to be quiescent, mature and non-proliferating. The diagnosis of osteoid osteoma was confirmed. The patient made an un-

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eventful recovery and stated that the pain had disappeared as soon as he regained consciousnes after the operation.

DISCUSSION

This condition is most frequently seen in children and young adults between the age of 10-25 years and is uncommon after the age of 30 years. It is twice more common in males. The bones commonly affected in decreasing order of frequency are tibia, femur, vertebrae, humerus, talus, phalanx (foot and hand), calcaneum, fibula and raidus (Dockerty *et al.*, 1951 ; Freiburger *et al.*, 1959 ; Jaffe, *loc. cit.*). No lesion in the skull and ribs have been described to date (Shankaran, 1954 ; Robbins, 1962) or in the mandible (Shankaran, *loc. cit.*). However, Lichtenstein (1959) reported on a single case of 12th rib involvement and Lapidus and Salem (1949) reported a case with 2 lesions in one femur, though only one could be confirmed pathologically.

The onset is insidious and the principal symptom is pain which is persistent but usually not of sufficient intensity to bring the patient under observation until several weeks or months have elapsed after the onset (Anderson, 1966) or even up to 2 years (Lichtenstein, *loc. cit.*). The pain which is localised and boring in noture, often worse at night is unaffected by rest and exercise (Lichtenstein, *loc. cit.*). Acetylsalicylic acid is believed to relieve the pain dramatically for varying periods and this has been mentioned as a diagnostic feature in the literature.

Clinical examination reveals a point of localised tenderness and a slight swelling at the site of the lesion (Anderson, *loc. cit.*) which may or may not be present. Local erythema and a rise of temperature are unusual. A small but significant number of patients with osteoid osteoma presents with neurological features as well as with joint disturbances before the bone findings are manifested (Phelan, 1965). When the lower limb is involved the patient usually develops a limp and a definite wasting of muscles may be present resulting from disuse atrophy (Graham, 1966 ; Denlin, 1967). Fever is absent and routine investigations (total and differential leecocyte counts and ESR) are within normal limits (Anderson, *loc. cit.*).

Roentgenological features—Typically, there is a radiolucent nidus, spherical or oval in shape, measuring from 0·5 to 2 cm. in diameter, surrounded by a zone of dense osteosclerosis. In our present case, the impression that is conveyed on examining the x-ray is that the lesion is radio-opaque whereas in fact the lesion is radiolucent. The reason for this has been attributed by Shankaran (*loc. cit.*), to the dense osteosclerosis around the small nidus which may be so intense in radio-opacity that it may often completely mask the area of translucency in the bone. The amount of surrounding zone of osteosclerosis depends upon the site of osteoid osteoma and the type of bone involved. It is most marked when the lesion is in or near the cortex of a long bone and least in cancellous bone (Fowler, 1964). Where the lesion is situated near the periosteum, the resultant periostial reaction assumes an onion peel appearance, typical of Ewings' sarcoma (Dockerty *et al.*, *loc. cit.*). Tomography is useful in difficult cases. Very often, the x-ray picture appears later than symptoms for some months or even a year (Lichtenstein, *loc. cit.*).

Pathology — (a) Macroscopically, the lesion is small, rarely more than 1 cm. in size, reddish brown, fairly discreet, firm nodule with a central "nidus" localised in either cancellous or cortical bone (Robbins, *loc. cit.*) or rarely subperiosteally.

(b) Microscopically, the nidus is made up of a confusedly interwoven network of small, irregular, generally thin and unevenly and unequally calcified osteoid trabeculae, some undergoing conversion into a typical bone rimmed by osteoid tissue. This triangle of osteoid trabeculae is set in a vascular osteogenic connective tissue that occasionally contains a few or many plasma cells. The impression usually gained is one of disorderly activity with obvious new bone formation and destruction. Osteoblast like cell may be numerous throughout the tissue and osteoclast like giant cells prominent in some areas (Sherman, 1947 ; Sevitt and Horn, 1954). The fine trabeculae of the nidus are distinctly separated from thick sclerotic but essentially normal bony trabeculae. that surround the lesion (Evans, *loc. cit.*). Plasma cell or lymphocytic infiltration has also been seen in some cases but not enough to suggest infection.

Aetiology—The widely held view is that it is a benign neoplastic condition, but it lacks the progressive growth, besides, if left alone, it could heal spontaneously (Sherman, *loc. cit.*; Moberg, 1951 ; Golding, 1954). However, the time taken to heal is unpredictable and may vary from 2 to 24 years. The pain gradually disappears and the surrounding sclerosis lessens but does not disappear completely (Vickers *et al.*, 1959, cited by Fowler, *loc. cit.*).

SUMMARY AND CONCLUSION

A case of osteoid osteoma has been reported. Though it is by now an established clinical entity but there are still a number of questions which have not been satisfactorily answered till date, but these do not relate to the identity of the lesion:

(1) Why is the lesion so small as a rule? (2) Why is it invariably painful? (3) What would happen to the lesion ultimately if it were left alone? (4) What is the effect of x-ray irradiation upon it (Lichtenstein, *loc. cit.*)? In course of time, however, the last question has been answered and it has been established that with radiotherapy recurrences and osteogenic sarcoma have been reported (Pack and Ariel, 1964). We look forward to the day when the other three questions would be answered satisfactorily as well.

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4

Association of Polycythaemia, Polycystic Kidneys, Diabetes Mellitus and Portal Hypertension

AJIT SINGH*, SATWANT SINGH**

NARINDER SINGH***

A large number of diseases is known to cause secondary polycythaemia. A comparatively new addition to the list of causes is renal disease. Bliss (1929) first described a case of hypernephroma with polycythaemia. However, he failed to recognise the causative role of the former and considered it as a coincidental occurrence. Now it is well established that about 10 per cent cases of hypernephroma have polycythaemia (de Wardner, 1963). The association of polycystic disease of kidneys and polycythaemia has been documented infrequently since then (Kurrle, 1954; Nixon *et al.*, 1960; Friend *et al.*, 1961). The relationship between the renal disease and polycythaemia is causal and not coincidental since palliation of renal lesion by surgery, is followed by remission of the latter. Thus, partial or complete nephrectomy in cases having renal cysts resulted in remission in polycythaemia (Forsell, 1958; Jones *et al.*, 1960; Nixon *et al., loc. cit.*; Kurrle, *loc. cit.*). Brandt *et al.* (1963) investigated 91 cases of polycythaemia vera for kidney lesions and found only two examples of bilateral polycystic disease out of 19 cases having renal lesions.

We wish to record a rare case of renal polycythaemia with bilateral polycystic disease of the kidney complicated by diabetes mellitus and portal hypertension.

Case Report

R. R., 61 years, male, was admited with us with the chief complaints of polyuria, polydipsia and polyphagia of 10 months duration and generalised weakness for the last 3 months. He was conscious of a gradually enlarging mass in the left hypochondrium for the last 3 months. There was no history of painful micturition, haematuria, paraesthaesiae. Past, personal and family histories were non-contributory

Physical examination revealed a moderately built and nourished individual with ruddy facial appearance and reddish blue discolouration of tip of the nose and tongue. Palms were also ruddy. Mild cyanosis was apparent. Neck veins were engorged and jugular venous pressure was raised. There were a few purpuric spots and ecchymotic patches scattered all over the body. Eyes were congested. Pulse rate was 90/minute with occasional irregularity, and blood pressure was 150/110 mm. Hg. Examination of the heart revealed a grade I systolic murmur and a triple rhythm in the left parasternal region. Chest examination revealed occasional rhonchi. Upper border of the liver was in the 7th intercostal space in mid-clavicular line and lower border was 4 cm. below the costal margin. The liver was smooth, firm and nontender. The spleen was palpable 10 cm. below the costal margin, firm in consistency. Right kidney was palpable, greatly enlarged in size with irregular surface Left kidney could not be palpated because of the big spleen. Fundus examination revealed myopic degeneration with no evidence of hypertensive retinopathy.

Investigations — Haemoglobin (venous blood) 20·1 g./100 ml. (Sahli's method), red blood cell count—7·6 million/c.mm.. total leucocyte count—12,400/c.mm. (normal 4 to 11·000/c.mm.) with polymorphs 70 per cent, lymphocytes 28 per cent and monocytes 2 per cent. Platelet count — 4,02000/c.mm., reticulocyte count — 0·8 per cent, packed cell volume—76 per cent (Wintrobe method), erythrocyte sedimentation rate 3 mm. 1st hour (Westergren), bleeding time 4′ 30″, clotting time 4′ 15″. Serum iron level was 145 μg./100 ml.; blood volume estimated by dye method (Evans blue) was 9458 ml. Urine analysis revealed albuminuria (1+) and glycosuria (4+) with occasional leucocyte per high power field. Blood sugar level was 200 mg./100 ml., blood urea—37 mg./100 ml., serum uric acid—4·4 mg./100 ml. and serum chloestrol—166 mg./100 ml. Prothrombin time was 30 seconds and prothrombin index 50 per cent. Serum bilirubin level was normal and flocculation test failed to reveal any evidence of parenchymal hepatic damage. Basal metabolic rate was raised +34 per cent (normal ± 15 per cent).

Electrocardiogram showed pattern of left ventricular hypertrophy. Skiagram of chest and abdomen were normal. Barium swallow revealed the presence of oesophageal varices whereas the stomach and duodenum were normal. Intravenous pyelography showed changes suggestive of bilateral polycystic disease of kidneys. Study of bone marrow revealed increased normoblastic reaction

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with numerous megakaryocytes, most of them in inactive phase and normal cellularity of the leucocytes. Liver biopsy was unsuccessful while splenic puncture was not contemplated since the patient's condition never allowed us to do this potentially hazardous procedure.

DISCUSSION

The subject of association of polycythaemia and renal carcinoma has been reviewed by Damon *et al.* (1958). A few report of polycystic disease of kidney with polycythaemia have also been recorded (Forssell, *loc. cit.*). This combination is probably commoner than the case reports suggest because it has been described under other headings by earlier workers.

The frequency of association of polycythaemia with various renal lesions has ranged from 0·3 to 2·6 per cent cases in various series (Harrison, 1966). Renal polycythaemia should be suspected in a patient whose polycythaemia is associated with normal arterial saturation with no increase in white cells or platelets and no splenic enlargement (Osnes, 1958). However, a number of cases may have leucocytosis and thrombocytosis (Jaworski and Hirte, 1961). Moreover, in a few patients, nephrectomy has been followed by a remission of polycythaemia in cases having leucocytosis, thrombocytosis and splenomegaly with renal lesions (Lawrence and Donald, 1959). In addition, an episode of haematuria points towards renal origin of the disease. In our case, no history of haematuria was forthcoming and the platelet count was within normal range. Splenomegaly was attributed to portal hypertension because of the presence of oesophageal varices. Cirrhosis of the liver is well known to occur in polycythaemia termed as "Mosse's syndrome" (Whitby and Britton, 1963). However, in the absence of liver biopsy report and normal liver function tests, splenomegaly could also be attributed to polycythaemia vera.

In 1905, Gaisbock described polycythaemia hypertonica characterised by hypertension, arteriosclerotic renal disease, and often cardiac hypertrophy and absence of splenomegaly. As already pointed out, some of these cases may indeed have been cases of renal polycythaemia as those of Kurrle (*loc. cit.*). Perhaps, Gaisbock's syndrome is a true entity of renal polycythaemia not associated with splenomegaly. Luke *et al.* (1965) further suggested that one should always look for polycythaemia in all cases of renovascular hypertension. Most authors argue that the absence of leucocytosis, thrombocytosis nad splenomegaly suggest renal polycythaemia although the validity of this view is questioned by Brandt *et al.* (*loc. cit.*). Our case, in many ways, resembles other cases of polycystic kidneys associated with polycythaemia, as reported by Kurrle (*loc. cit.*), Forssell (*loc. cit.*), and Jones *et al.* (*loc. cit.*). Polycystic disease of kidney associated with polycythaemia may be unilateral as in 3 of the 6 cases recorded by Jones *et al.* (*loc. cit.*). Jones *et al.* (*loc. cit.*) studied bone marrow in 10 patients suffering from nonneoplastic renal lesions; evidence of increased erythropoiesis was observed in 5 of them. In our cases too, bone marrow showed increased normoblastic reaction with no increase in myeloid activity.

The mechanism of occurrence of polycythaemia in renal disease is uncertain. An increase in renal tissue mass may be associated with increased red cell production. Penington (1962) suggested that nephrons respond to decreased perfusion by an increased production of erythropoietin. The latter is a mucoprotein which stimulates erythropoiesis. Osnes (*loc. cit.*) postulated that the juxtaglomerular apparatus might be the site of erythropoietin and renin production. This hypothesis has been supported by Hirashima and Takaku (1962) on the basis of their experimental work. Luke *et al.* (*loc. cit.*) observed that the erythropoietin production could be stimulated by a reduction in renal blood flow rather than by renal parenchymal disease *per se*.

SUMMARY AND CONCLUSIONS

An interesting case of polycythaemia, bilateral polycystic disease of kidneys with associated portal hypertension and diabetes mellitus is presented. The relevant literature is reviewed and the characteristics of renal polycythaemia are stressed. The entity appears to occur more frequently than the case reports suggest since earlier workers failed to appreciate the causative role of associated renal lesion in cases of polycythaemia.

ACKNOWLEDGMENT

We are grateful to Dr. R. P. Malhotra, Professor of Medicine, for allowing us to publish this case report We are also grateful to the Departments of Pathology and Radiology for carrying out various investigations.

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JOURNAL OF THE
INDIAN MEDICAL ASSOCIATION

CALCUTTA, AUGUST 16, 1973

Basic Medical Sciences and Surgical Studies

The changing relationship between the basic medical sciences and surgery in recent times is reflected by the subtle change in the definition of the word 'surgery'. Its time honoured definition as the art of treating injuries, deformities and other disorders by a manual operation or instrumental appliances is now being replaced by the one proposed by Lord Brock in 1967, as the science of understanding, and the act and art of controlling or modifying usually by a manual operation, the response of the body to disease or injury. Lord Brock pointed out that surgery comprised three components; the crude act of surgery, which historically appeared first: then the art of surgery: and finally the science of surgery, introduced mainly through the work of John Hunter at the end of the 18th century and that of Lister a century ago.

The science of surgery has over the last two centuries gradually been built up on three basic medical sciences of anatomy, physiology and pathology but this traditional tripod is no longer able to sustain its phenomenal growth over the last few decades. Almost all scientific disciplines, physical, biological and behavioural have contributed to the present state of surgical services. It is therefore becoming more and more necessary that a surgeon devotes a considerable portion of his time to the study of basic sciences irrespective of whether he chooses to engage in the pedestrian practice of doing the greatest good to his patients, or in extending the frontiers of surgical science. The latter activity has incidentally resulted in a tremendous accretion of knowledge in many basic disciplines, knowledge that would have been hard to come by in the absence of surgical endeavour.

The education of a surgeon in basic sciences commences in the secondary school and in the premedical course, long before he seriously contemplates taking up surgery as a career. It is continued in right earnest in the undergraduate medical curriculum. In this period about half the total available time is universally devoted to basic disciplines, but the curriculum is designed in different ways in different countries, and even in different institutions in the same country. The end result of this course is what is called in this country, the basic doctor. After this, begins the third and most important phase of surgical education; the transformation of the basic doctor into a trained surgeon. There seems to be universal agreement that the study of basic medical sciences should play an important part in this metamorphosis, but considerable disagreement about the precise methodology.

One of the methods in vogue in the western hemisphere and the European continent is to arrange employment for the surgical trainee in one or other basic science department for a varying length of time, after which he automatically reverts back to a surgical post. Another method is to make it obligatory for a candidate to spend some time in a laboratory conducting a piece of investigation related to surgery. In the United Kingdom, the Royal Colleges of Surgeons assume most of responsibility for the training and assessment of surgical neophytes. These colleges have organised Departments of Basic Medical Sciences and have decreed that a candidate must satisfy a Board of examiners that he has sufficient knowledge of anatomy, physiology and pathology before he is allowed to appear in the final examination in Surgery. It is customary that surgeons and experts in basic medical sciences are equally represented on the Board of examiners: the examination is open to virtually all doctors and helps to weed out undesirables from continuing the pursuit of surgery. To enable the candidate to prepare for the examination, a variety of courses of instruction are available, all of which are optional.

In this country, postgraduate medical education remains in the hands of a very large number of autonomous universities and a few centrally administered institutes, and is very loosely supervised by the Medical Council of India. The Council recommended 2 years ago that for the Master of Surgery 'there shall be proper training in basic medical sciences *related to the discipline concerned* (italics, ours) as well as a paper in these subjects at the examination'. At the present time, some institutions follow the Council's recommendation in letter and spirit; many pay only lip service to them and pay very little attention to basic medical sciences; while a few attach to them an importance out of all proportion to what was in the Council's mind. The end result of all three systems in the Indian M.S. and in the eyes of the vast majority of employing agencies in this country and abroad, one Indian M.S. is as good as another. The Indian university which insists on following the British pattern of two examinations, Primary and Final, deserves the warmest congratulations and support, but its candidates are placed at a considerable disadvantage compared to their contemporaries of other centres if the additional effort they have to put in goes unrecognised.

The disadvantage is all the more acute if the Indian university tends to offer only one course in basic medical sciences which is prolonged, full-time, compulsory and uniform design, supposedly to suit the needs of all postgraduates, whether of surgery or of dermatology, and if it chooses to arrange for an examination in which the clinical teacher has little say.

On the other hand, the university that all but ignores basic medical sciences, places on the market a substandard product; though initially acceptable as the real thing, he will sooner or later be found wanting, unless he takes the trouble to make good his deficiencies subsequent to qualifying.

This then is the fourth phase of a surgeon's education his continuing education during the period of practice as a qualified surgeon. In this period, it becomes incumbent on all surgeons, particularly on surgical teachers, to keep abreast of new developments in the different sciences. For a busy surgeon this is indeed difficult. This difficulty has been reduced in many centres by arranging suitable refresher courses and by the practice of sabbatical leave, during which period a surgeon can leave his patients for a while and work out a project in a laboratory in collaboration with a colleague in a basic science department.

SUBIR K. CHATTERJEE

Medicine and Sports

In our country, physical education is an extra-curricular item i.e., a vacant and barren area within the existing educational system. A few States e.g., Punjab in particular and West Bengal to a certain extent are planning to have sports as a compulsory subject in school syllabus

It is high time that our national plans and programmes should be devoted to making sports the concern of everybody in a modest way, at least at leisure hours. The question in our country is how the uninterested, timid, retarded or the older age groups could be made to attain some performance (not gold medals) appropriate to their power.

At present we need mass participation in sports and physical activities with facilities under medical supervision for preventing the danger of injuries. A W.H.O. scientific group has pointed out that leisure-time physical activity is associated with a lower risk of ischaemic heart diseases and this has a well established place in the treatment of several diseases and disorders and plays a major role in medical and occupational rehabilitation. It also solves various juvenile, puberal and geriatric problems.

Exercise habits for physical fitness are best undertaken at an early age e.g., between 6 and 12 years. In developing motor skills, the endurance training (e.g., running) should not be neglected, since it will promote cardiopulmonary fitness besides the skills in diverse sporting activities. If there is a rise in maximal oxygen consumption, we can assume that we are improving cardiopulmonary fitness.

The chance of combating atherosclerotic cardiovascular diseases which is essentially a geriatric problem is likely to bear fruit if physical exercises are started early in life.

To make an effective combination, skilled physical educators and qualified trainers should work with trained sports doctors. Sports medicine, as a speciality, needs at least condensed courses in the universities to produce sports doctors. Physical educators should be qualified to teach health, physical education, biology, elementary hygience, etc. An average physician, especially those who are not sports-minded or have not played any games (including quite a number of parents), do not have the time or inclination or aptitude for making their wards sports-minded.

Nowadays, the main items of sports medicine are occupational and performance medicine, and these are making great progress, specially in highly developed countries.

Besides tackling the usual environmental, nutritional, traumatological, and physiological problems, the adviser on modern sports will have to be well versed in other aspects of sports science, i.e., its psychology, sociology, philosophy, methodology and kinesiology.

The recently concluded highly successfull IIIrd National Seminar on Sports Medicine held at Medical College, Calcutta, was attended not only by doctors but by eminent players, coaches, trainers, physical educators/culturists, masseur, physiologists, psychologists, sports journalists and sports administrators. The multidisciplinary approach of sports medicine needs the conjoint action of specialists in sports science as mentioned above.

Sports medicine in India is still in its infancy, while the affluent and developed countries have already come of age. Yes, we admit that we are lagging behind in this science, as in many other fields, but a beginning has been made in the right direction by the Indian Association of Sports Medicine. Besides, socio-economical aspects the Indian Association of Sports Medicine will have to fight a relentless battle against poverty, malnutrition and ignorance. Unlike our foreign colleagues, we will have to start with a handicap. This is that we are not getting healthy kids to mould.

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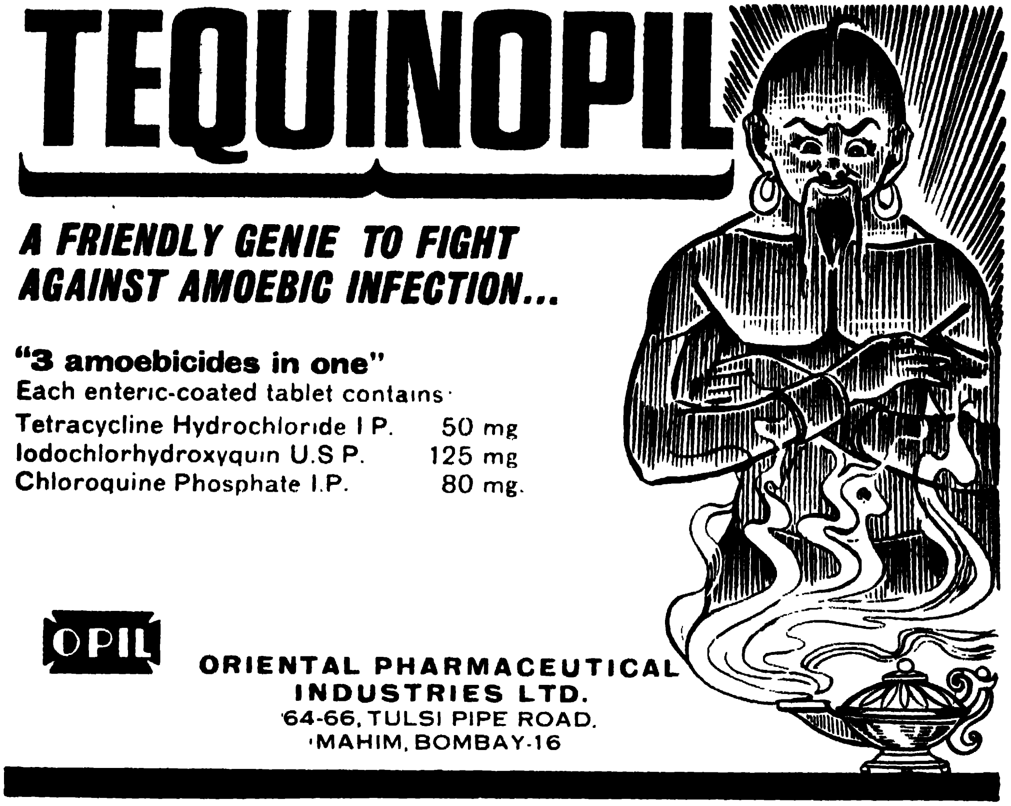

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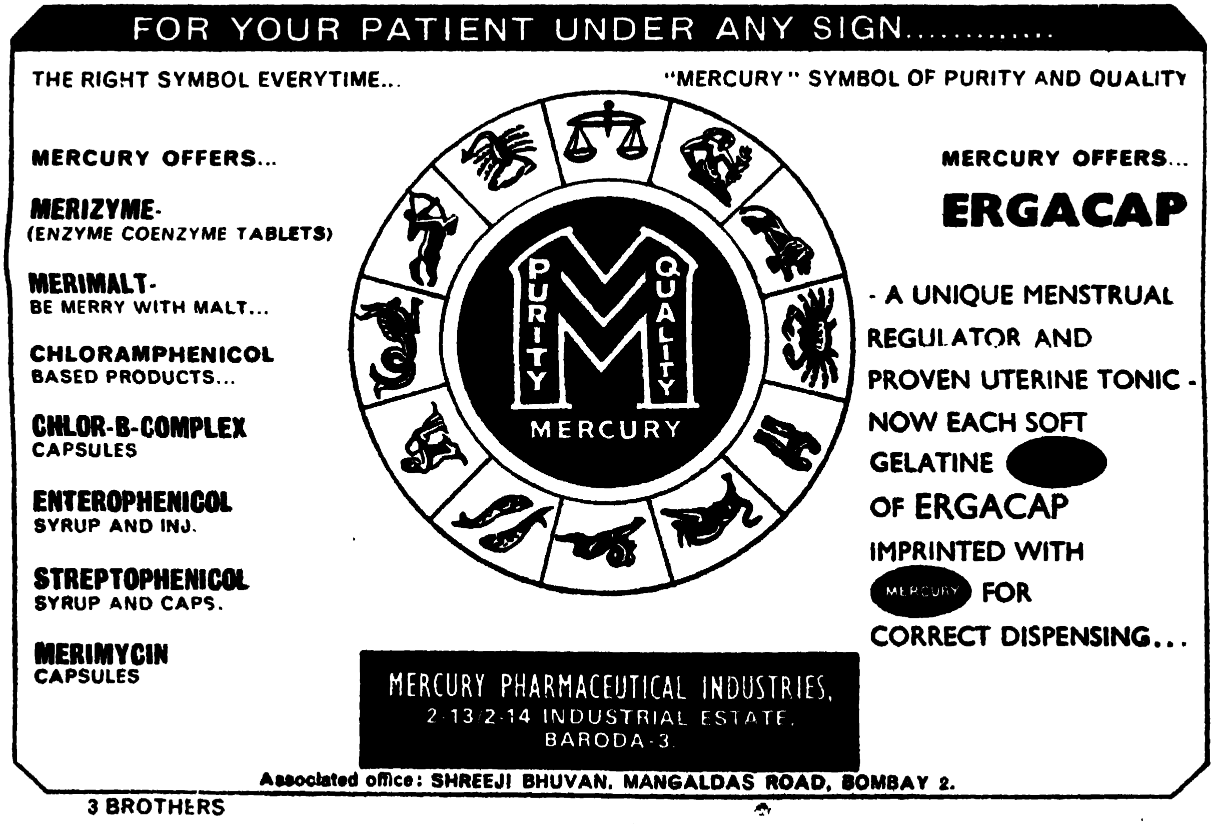

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CURRENT MEDICAL LITERATURE

Body Temperatures After Rugby

DANCASTER, C. P. (*S. Afr. Med. J.*, **46**: 1872, 1972) from Grey's Hospital, Pietermaritzburg, observes:

Body temperatures of over 41°C have been recorded immediately after rugby games. Temperatures were higher on hot days early in the season, when nearly 70 per cent of the players had temperatures of over 40°C. In view of the possibility of heat-stroke, it is suggested that in the early season, if the air temperature is above 28°C at the commencement of the game, that as a minimum safety precaution each half should be restricted to 30 minutes, or that the early season games are played in the evenings.

In exercise, about three-fourths of the energy expended is converted into heat which is dissipated from the body by sweat evaporation. This is naturally a less efficient method of cooling on hot humid days than on cool days. After rugby on a hot day, players are often exhausted, particularly if they are not acclimatised to the local conditions.

The effects of air temperature and humidity on body temperatures have been studied after rugy, both at the beginning of the season and in the late season.

The main factors which have been shown to predispose to high body temperatures are high air temperatures and early season games, when players are not physically fit or acclimatised. These conditions are likely to be present at the commencement of the season in subtropical coastal areas, where early season games should be played in the evenings. Alternatively, if the air temperature is above 28°C at the commencement of play, as a minimum safety precaution, play should be restricted in each half to 30 minutes, instead of the customary 40 minutes. Even this precaution may not obviate the danger of heat-stroke, and it may be safer not to play early season games when the air temperature is above 28°C. In the event of a match being played in hot weather and a player collapsing, or behaving in a strange manner, the attending medical officer should suspect heat-stroke and take an immediate rectal temperature. If this is above 41°C, then the diagnosis is confirmed and the player should be immediately cooled until his rectal temperature comes down to 38°C. (An oral temperature in these conditions is quite misleading and is useless).

Emergency Surgery in the Geriatric Patient

JAVETT, S. L. (*S. Afr. Med. J.*, **46**: 2026, 1972) from Brenthurst Clinic, Parktown, Johannesburg, writes:

The results of an aggressive surgical policy in 44 patients over the age of 70 years are presented. There were 34 elective and 18 emergency operations. Thirty-five operations were considered major procedures. There were 8 deaths, 7 occurring in the emergency group, and all were major operations. During the period considered no patient was refused operation.

The combination of age and an elective operation, whether major or minor, is no hazard to the geriatric patient. Prophylactic elective surgery for groin hernia, symptomatic biliary tract disease and duodenal or gastric ulcer is recommended.

In geriatric patients the chance of survival with emergency surgery is just over 50 per cent in situations where conservative management may be associated with 100 per cent mortality. This figure is important when one is considering conservative management as a compromise, simply because the patient is regarded as 'too old for operation'.

Benefits from surgery in this age group may be dramatic and there is no justification for denying surgery. The difficulties of management should be seen as a challenge and not as grounds for conservative non-operative care in equivocal cases.

Saving the Amputated Digit and Hand

O'BRIEN, B. McC., MILLER, G. D. H. McLEOD, A. M. AND NEWING, R. K. (*Med. J. Aust.*, **1**: 558, 1973) from Plastic Surgery Unit, St. Vincent's Hospital, Melbourne, state:

Indications for replantation of fingers and hands are discussed. Success has been achieved in guillotine and moderate crush injuries but avulsion injuries have presented problems. A brief outline of the technical approach and postoperative management is given.

Twenty cases, involving 27 incomplete and completely amputated digits, have been treated. All 8 incompletely amputated ischamic digits have survived and 13 of 19 totally amputated digits were successfully replaced. In addition, 2 completely amputated hands and 1 incomplete and 1 complete below elbow amputation have survived.

Secondary surgery has been completed on the majority of patients with improved function and return to work. A long-term evaluation of hand function is necessary but the present results are encouraging, particularly in nerve regeneration.

The organisational aspect of a replantation team together with first-aid instructions are included, and the value of a multidiscipline type research programme stressed.

Asymptomatic Gonorrhoea in Women

ELLERMAN, L., FISHER, S., GILL, R. C., HYSLOP, R. S., JENNIS, F., O'CONNOR, B. F. AND OSBORN, R. A. (*Med. J. Aust.*, **1**: 289, 1973) from the Department of Bacteriology, The Women's Hospital, Crown Street, Division of Epidemiology, New South Wales Department of Health, Department of Gynaecology, The Hornsby and District Hospital, Department of Obstetric and Gynaecology, Liverpool District Hospital, Department of Microbiology, Sydney Hospital, Department of Microbiologist, Institute of Clinical Pathology and Medical Research, Lidcombe, and the Department of Pathology, Royal Hospital for Women, Paddington, write:

Cervical and urethral swabs were examined for *Neisseria gonorrhoeae* for 4,768 women. The reasons for attendance at various centres were for routine antenatal examination (1,411), cervical cancer check (1,075), general gynaecological examination (985) and family planning consultation (1,297). Five public hospitals and the Family Planning Association of Austrialia Clinic, all in Sydney, participated in the survey.

None of the subjects exhibited signs or symptoms suggestive of genital gonorrhoea. Gonococci were found in six patients; five of these were antenatal patients and one presented with vaginal bleeding. All isolations of *N. gonorrhoeae* were made from women aged 22 years or less. The incidence in this age group appeared to be disproportionately high.

Sodium Bicarbonate in Treatment of Osteomalacia

RICHARDS, P., CHAMBERLAIN, M. J. AND WRONG, O. M. (*Lancet*, **2**: 944, 1972) from Medical Unit, St. Mary's Hospital Medical School, London W. 2, Dudley Road Hospital, Birmingham and Medical Unit, University College Hospital Medical School, London W.C. 1, write:

Healing of osteomalacia in response to treatment with sodium bicarbonate alone was compared in two women with renal tubular acidosis. One had normal glomerular function, the other had chronic renal failure as a result of nephrocalcinosis and renal calculi. The bone pain of the woman with normal glomerular function was quickly relieved, and osteomalacia healed completely within one year of correction of acidosis by regular treatment with sodium bicarbonate. Acidosis was not completely corrected in the ureamic women; bone pain was relieved and psudofractures healed, but her serum-alkaline-phosphatase remained high during treatment with alkali until she was treated with a large dose of calciferol (vitamin D_2). It is suggested that osteomalacia in patients with renal tubular acidosis who are not ureamic should, in the first instance, be treated with alkali alone because of the dangers inherent in treatment with vitamin D.

Coal Mining and Cancer of the Stomach

MATOLO, N. M., GORISHEK, W. M., MOSLANDER, V. AND DIXON, J. A. (*Rocky Mountain Med. J.*, **69**: 44, 1972) from the Department of Surgery, University of Utah College of Medicine and the Utah State Tumour Registry, Rocky Mountain States Cooperative Tumour Registry, Salt Lake City, Utah, Observe:

Carbon and Emery Counties are soft coal mining regions. The incidence of gastric cancer in these two counties is five to six times that of adjacent Utah County, which has no coal industry, and three to four times that of the State of Utah and of the Uited States.

A detailed study of patients with gastric cancer in the coal mining region revealed that 52·2 per cent of patients in Carbon County and 28·6 per cent of patients in Emery County were coal miners. The gastric cancer incidence in coal miners was 15 times that in non-coal miners in Carbon and Emery Counties, but over 40 times that in non-coal miners in Utah and other non-coal mining counties. All the homes of patients afflicted by gastric cancer in both Carbon and Emery Counties were heated with coal, and in some of the homes coal was used for cooking. In Carbon County 39·1 per cent of gastric cancer patients were born in foreign countries.

In Utah County none of the gastric cancer patients were coal miners. Furthermore, the homes were heated with either natural gas or electricity. The age distribution, diet, socio-economic class distribution, and climate were similar in all three counties. Carbon County has a heterogenous population but Emery and Utah Counties have similar ethnic, religious, and social backgrounds.

It is concluded that there is a statistically significant high incidence of gastric cancer in Carbon and Emery Counties. Coal mining and the extensive use of soft coal in this area might be an aetiologic factor.

Ulcerative Colitis and Clubbed Fingers

PERRY, P. M., EVANS, G. A. AND DAVIES, J. D. (*Dis. Colon Rectum*, **15**: 278, 1972) from the Departments of Surgery and Pathology, St. Bartholomew's Hospital, London, E.C. 1, England, comment:

In a retrospective study of patients with regional ileitis or ulcerative colitis, it was found that 23 of a total of 68 patients with the histologic diagnosis of regional ileitis, confined to the area of the gut supplied by the vagus nerve, had clubbed fingers. The marked fibrosis in regional ileitis may well be a factor in the reflex mechanism responsible for clubbing of the fingers. By contrast, only three patients of a total of 77 with the histologic diagnosis of ulcerative colitis had clubbed fingers, and two of these patients had associated hepatic cirrhosis.

Effect of Oxyphenbutazone on Liver Function

PENTIKAINEN, L. A. AND MUSTALA, O. O. (*Ann. Clin. Res.*, **4**: 296, 1972) from the Medical Department of Kivela Hospital, Helsinki, and Second Department of Medicine, University of Helsinki, Helsinki, Finland, comments:

The effect of oxyphenbutazone on liver function tests has been studied in patients both with and without liver disease. After treatment with oxyphenbutazone for 10 days (600 mg./day) a significant decrease of bilirubin levels and an increase of BSP retention time were observed. In both instances, the magnitude of the change varied directly with the amount by which the initial values varied from the normal. These changes became more prominent when a 20-day treatment schedule was followed by an increased dosage (1200 mg.) on days 11-20. A single dose of oxyphenbutazone (400 mg.) had no effect on bilirubin or BSP values in patients with liver disease. In no instance were there changes in SGQT, SGPT, LDH or alkaline phosphatase levels.

Working Capacity in Severe Chronic Obstructive Lung Disease

TAMMIVAARA-HILTY, R. (*Upsala J. Med. Sci.*, **77**: 189, 1972) from the Departments of Clinical Physiology and Pulmonary Diseases, University Hospital, Uppsala, Sweden, states:

Twenty-five patients (mean age 61·2, range 39-72 years) with severe chronic obstructive lung disease, with a maximum voluntary ventilation MVV$_F$), without bronchodilating spray, $\geqslant$ 35 per cent of the individually predicted normal value, were classified into two groups: (1) a group who had suffered from at least one period of absolute respiratory insufficiency (R), with 8 men and 6 women, and (2) a comparison (C) group with the corresponding degree of MVV$_F$ limitation but without any period of absolute respiratory insufficiency, with 10 men and 1 woman. The patients were studied in their habitual state by a standard ergometrebicycle exercise test. The highest performed work load, near maximal (W$_{max}$), was determined, and also the pulmonary gas exchange, arterial-blood (O_2 and CO_2) gas tensions, lactate concentration and acid-base balance under the conditions of maximum work load.

MVV_F and W_{max} were found to be positively correlated in the R and C groups, but not in the female patients. W_{max} was also correlated to other factors, namely negatively to resting (lowest functional residual) FRC/TLC and RV/TLC (residual ratio), and to V_D/V_T (physiological dead space ratio) measured under maximum working conditions. Average W_{max} was 189±52 in the male R group and 118±37 kpm/minute in the female, and in the male C group 256±40 kpm/minute. W_{max} in kpm/minute per kg. body weight was in the R group 2·63±0·57 and in the C group 4·29±0·65. There was a tendency to lower PaO_2 and CaO_2 during maximum work and higher heart rate in relation to work load in the R group than in the C group although this was not statistically significant.

Trimethoprim-Sulphamethoxazole in Urinary Tract Infections

DUNGAN, R. W. (*Med. J. Aust.*, **1**: 536, 1973) from 117 Millswyn Street, South Yarra, Vic. 3141, states:

One hundred and sixty-seven patients with symptoms of urinary tract infection were treated with courses of trimethoprim and suphamethoxazole for up to 14 weeks. By the very nature of the practice, the patients admitted to the trial tended to be those suffering from chronic and intractable infection, which tested the efficacy of the combination in realistic conditions.

The success rate for the usual simple *Escherichia coli* infections was 94 per cent. Twenty-six per cent of patients in the group as a whole achieved sterile urine at two weeks, while, with prolongation of treatment to 14 weeks, sterile urine was achieved by 63 per cent.

Unwanted effects, which may or may not have been related to the drug, were noted in 12 cases; all were mild and readily reversible. Therapy was discontinued in two cases because of skin rash, and in two others because of vomiting. No incidence of haemopoietic or renal toxicity was observed. A common problem with broad-spectrum antibacterials is monilial overgrowth; this was not seen during the trial. All *Esch. coli,* isolated in the study, were sensitive to septrin, and no resistance organisms emerged as a result of the intermittent therapy.

Peritoneal Dialysis Solutions

GAULT, M. H. (*Canadian Med. Ass. J.*, **108**: 325, 1973) from the Department of Medicine, Queen Mary Veterans Hospital, Montreal, P.Q., writes:

Certain preventable complications in the treatment of renal failure, in part related to the composition of commercially prepared peritoneal dialysis solutions, continue to occur.

Solutions are advocated which would contain sodium 132, calcium 3·5, magnesium 1·5, chloride 102 and lactate or acetate 35 mEq./litre, and dextrose 1·5 per cent or about 4·25 per cent. Elimination of 7 per cent dextrose solutions and a reduction of the sodium and lactate concentrations should reduce complications due to hypovolaemia, hyperglycaemia, hypernatraemia and alkalosis. Reduction in the number of solutions should simplify the procedure and perhaps reduce costs. It is anticipated that some of the changes discussed will soon be introduced by indutry.

Treatment for Cerebral Concussion

RELANDER, M., TROUPP, H. AND BJORKLSTEN, G. AF. (*Brit. Med. J.*, **4**: 777, 1972) from Neurosurgical Clinic, Helsinki University Central Hospital, Helsinki, Finland, comment:

In a study designed to compare two types of treatment of cerebral concussion. 178 patients were allocated to a routine treatment or to an active treatment group; in the latter a good prognosis was emphasised, the patient was mobilised early and given physiotherapy. In the routine treatment group the average time off work was 32 days compared with 18 days in the active treatment group. Physiotherapy seemed to be particularly valuable in old patients and in those with exaggerated fears about their condition. It is suggested that throughout their illness and follow-up, patients with cerebral concussion should be under the care of one doctor, one who is particularly interested in the subject and that more propaganda is needed among hospital staff that concussion is not necessarily a dangerous condition.

Retinal Strokes

KOLLARITS, C. R., LUBOW, M. AND HISSONG, S. L. (*J. Amer. Med. Ass.*, **222**: 1273, 1972) from the Depart of Ophthalmology, Division of Neurology and Department of Radiology, Ohio State University Hospitals, Columbus, state:

Seventy patients with retinal strokes were seen from August 1969 to March 1972. Fifty-three of these patients had a clinical picture suggestive of retinal artery occlusion due to emboli from atheromatous disease of the carotid bifurcation. Carotid arteriograms were performed in 45 of these patients. Carotid bifurcation atheromata were demonstrated as the probable source of emboli in 43 of the 45 patients (96 per cent).

Review of a series of 100 consecutive carotid arteriograms performed in hospital patients 60 years of age or older demonstrated an overall incidence of similar carotid atheromatous disease in only 24 per cent. The striking incidence of carotid lesions in patients with retinal stroke syndromes suggests that most retinal strokes are caused by embolisation from carotid bifurcation atheromata.

Carotid atheromata can be found in the majority of retinal stroke patients, especially those who have no clinical evidence of cardiac embolic disease. These patients may be subject to other retinal or cerebral stroke episodes or both within four to five years of their first eye symptoms.

Patients with retinal stroke whose history is compatible with embolisation from atheromatous vascular disease can be identified easily by critical carotid arteriography. Carotid surgery may prevent progressive ocular and cerebral vascular occlusive disease in these patients.

Visual Disturbances After Missile Head Injuries

ADELOYE, A. (*Brit. J. Ophthal.*, **56**: 905, 1972) from Neurosurgery Unit, University of Ibadan, Nigeria, West Africa, observes:

Disturbances of vision after head injury, both in war and in peace, have been recognised for a long time; they were observed after gunshot wounds of the head during the Russo-Japanese war, the first world war, and the second world war. At University College Hospital, Ibadan, Nigeria, we dealt with 250 patients with missile head wounds during the Nigerian civil war; 31 of these patients (28 soldiers and 3 civilians) developed disturbrances of vision and a brief analysis of the visual lesions encountered forms the subject of this paper.

As far as is known, the 31 patients with visual disturbance had had normal vision before being injured. They were all assessed clinically and treated subsequently at the neurosurgical and opthalmological units. Fifteen were lost to follow-up as a result of troop movements during and after the war and sixteen were followed up for from 1 month to 3 years.

Visual disturbances were found in 31 Nigerians after missile head injuries. Visual loss from anatomical damage to the visual pathway predominated. The loss was permanent in peripheral lesions, but a reasonably good recovery was seen in lesions of the optic radiation and visual cortex.

Reversible Toxic Psychosis After Cephalexin

SAKER, B. M., MUSK, A. W., HAYWOOD, E. F. AND HURST, P. E. (*Med. J. Aust.*, 1: 497, 1973) from the Department of Medicine, Royal Perth Hospital, Perth, W.A. 6001, write:

Cephalexin is a new semisynthetic derivative of cephalosporin C, which has the property of being well absorbed from the gastro-intestinal tract when administered orally. It has a broad range of antibacterial activity and has been used successfully in treating bacterial endocarditis.

Clinical studies have shown that the drug is removed from circulation almost entirely by the kidney. Prolongation of serum activity has been demonstrated in patients with impaired renal function.

Side effects have been remarkably mild and mainly consist of gastro-intestinal upsets, skin rashes and monilial vaginitis.

We report here the case of a patient with moderately severe uraemia with suspected bacterial endocarditis, who developed convulsions and a toxic confusional state after administration of cephalexin.

CURRENT TOPICS

1

Testing Penicillin Allergy

SISIR K. MAJUMDAR*

Allergy means altered energy or in the words of Von Pirquet, it is "changed or altered reactivity". Allergy and hypersensitivity are synonymous; allergy is a qualitative change while hypersensitivity is a quantitative connotation. In the classical coinage of Cannon immunity is a manifestation of the wisdom of the body while loss of homoeostasis or allergy or hypersensitivity is the stupidity of the body. Hypersensitivity may be immediate or delayed type. Anaphylaxis is an immediate-type hypersensitivity.

Penicillin is the queen of antibiotics. But the small molecule has come to be the most frequent cause of anaphylaxis in man. Penicillin G is a hapten and lacks the chemical structure to effect covalent linkage with body proteins, thereby becoming a complete antigen which could evoke antibody synthesis in the body. The development of hypersensitivity is not due to the effect of unaltered penicillin but is induced by degradation products of the drug, diastereoisomeric N-(alpha-benzyl-penicilloyl) groups, predominantly epsilon-N-(alpha-benzylpenicilloyl)-lysine (Levine and Ovary, 1961; Parkar, 1963). This hapten combines with body proteins to form complete antigen which causes immunologic provocation. Cross-allergenicity is thought to occur because all penicillins are derivatives of 6-amino penicillanic acid and so produce similar metabolites after biotransformation within the endoplasmic reticulum of the liver by microsomal enzymes.

The performance of skin testing with penicillin itself is fraught with the danger of provoking a severe or even fatal reaction as anaphylactic shock. Penicilloyl-polylysine has been clinically applied to detect the preasence of hypersensitivity to penicillin (Parker and Thiel, 1963). With this diagnostic agent 35 per cent of individuals known to be sensitive to penicillin showed a positive skin reaction, and 6·8 per cent of non-allergic persons had positive tests (Rytel *et al.*, 1963). Presence of an important degree of hypersensitivity to penicillin can also be determined by skin scratch or conjunctival test with a small quantity of the drug. It has been proposed that penicillin—allergy may be detected by demonstrating degranulation of rabbit basophils exposed to a mixture of penicillin and serum from patients hypersensitive to the drug (Katz *et al.*, 1964).

As the years rolled on, a host of other tests were evolved to swell up the domain of methodology.

Leucocytes of ragweed-sensitive human donors when reacts with a purified pollen antigen release histamine which occurs as a response of sensitive cells to a specific allergenic stimulus. The use of human leucocytes, rather than animal cells is significant in view of the known species variations regarding the site of storage, the nature, quantity and tissue reactivity to those vasoactive autocoids whose production by the antigen-antibody reaction heralds the anaphylactic process; released histamine can be assayed quickly by spectrophotofluorometric method (Lawrence and Abraham, 1964).

Complete safety cannot be ensured by any single test at present available. A scheme of tests has been suggested (Assem and Schild, 1968):

(a) Passive sensitisation of human lung for detection of serum reagins—positive reaction does not require any further test.

(b) *In vitro* challenge of the patient's own leucocytes with penicillin, penicilloyl-polylysine and other antigens and then bio-assay of the histamine released in the process. But it is a time-consuming process.

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(c) Direct skin testing when the response is negative to the above set of tests.

If all these tests are negative, subjects are unlikely to develop any hypersensitivity to penicillin. Practical drawback in this scheme is the non-availability of human lung and much less sensitivity of monkey lung to histamine than human lung.

The *in vitro* radio-allergosorbent test, has been evolved to detect allergen—specific antibodies of a new immunoglobulin class, provisionally called Ig ND; antibodies to 14 different antigens were detected in the sera of hypersensitive subjects. A 96 per cent agreement was obtained between results from provocation tests and the *in vitro* test for hypersensitivity. This test might offer an important clue for the clinical diagnosis of hypersensitivity to various allergens (Wide *et al.*, 1967).

The diagnostic utility of skin testing before parenteral administration of penicillins with the reagents available today is another controversial matter. Skin testing with penicilloyl-polylysine is positive in many patients who then exihibit no hypersensitivity reaction to penicillins and sometimes negative in persons who respond anaphylactically (Macgregor *et al.*, 1971). In order to eliminate false-negative reactions, other test materials like penicillin G or some of its metabolites can also be used. But caution needs to be taken as these test materials may provocate different degrees of hypersensitisation including even anaphylactic shock in sensitised individuals (Macgregor *et al., loc. cit.*).

It needs to be mentioned that skin testing with penicillin is dangerous in patients with a history of anaphylaxis. Of course other newer *in vitro* tests including histamine release from leucocytes (Lawrence and Abraham, *loc. cit.*), the use of passively sensitised lung tissue (Assem and Schild, *loc. cit.*), and the radio-allergosorbent test (Wide *et al., loc. cit.*) would be valuable in establishing the diagnosis of penicillin allergy. The point needs stressing that a simplified bedside test is long overdue for day-to-day clinical practice; the techniques available at present are best suited for research purpose. It can be reasonably expected in the present spate of advancement in medical sciences that ripples of refinement will fast spread to this uncrossed frontier in diagnostic medicine. Prophylaxis will no longer pose a problem in therapy.

Hypersensitivity to penicillin is considered to be the most common cause of allergic reactions (1 to over 10 per cent) produced by drugs today (Feinberg, 1961). Factors predisposing individuals to sensitivity are still not fully known (Van aradel, 1965). Immunogenetical predisposition and pharmacogenetical aberration (so far steps of biotransformation leading to the formation of antigenic determinant is concerned) need to be critically studied. A suitable antigenic analogue—penicilloyl-polylysine has been synthesised to test an individual's state of hypersensitivity without itself sensitising or producing a hypersensitivity reaction (Parker *et al.*, 1962). A preparation containing, on average, 20 lysine groups per molecule, bearing 12 to 15 penicilloyl groups, has been found to be the most suitable (Deweck, 1963). But very few hospitals in the world have stock of this test substance. There is little danger of death resulting from the most acute manifestation, anaphylaxis, provided proper precautions are taken; nevertheless irreversible residual brain damage caused by secondary cerebral anoxia is a hazard that makes emergency therapy mandatory (Cohen, 1963).

Environmental and hereditary factors might play a significant role in the causation of drug allergy; intensive research is needed to unfold the various mechanisms involved in the production of hypersensitivity (West, 1967). Prediction of drug response in man is certainly the yardstick of the attainment of perfection in the clinico-diagnostic sphere of medical sciences.

Phobia pervades the medical profession regarding the anaphylactic action due to penicillin; this reaction is really rare but has been tremendously and irrationally exaggerated by the lay-press and also on the floor of national parliament in this country. If probably occurs in 1 out of 100 or so but for that unfortunate and unpredictable one in a doctor's chamber, the prestige, prosperity and even the physical existence of the doctor might be the first casualty for no fault of his. It is true that this reaction—mild or severe is not likely to occur on first administration in patients who have not tasted penicillins in any form or fashion before but can occur on any subsequent administration if sufficient circulating antibody is available in the blood. However, it is advisable to keep the emergency drugs ready at hand whenever penicillin, vaccines or any other allergenic drugs is administered parenterally. Mass education through popular press, radio, etc., and adequate enlightenment of the profession in this matter are some of the steps which are worth-taking. Wrong notions about penicillin allergy need to be eradicated from both popular and medical minds otherwise a really needy patient may be deprived of the benefit of such a novel antibiotic.

The era of antibiotic therapy began with the introduction of penicillins in 1940; though newer semi-synthetic penicillins are not immune from inherent antigenicity, penicillins with its merits and demerits is stil the leader of antibiotic orchestra. Except rare anaphylactic reaction penicillins do not have any other serious toxicity. A product of the bed-pans at Oxford is still beaming in its reflected glory and it is not an illusion to aspire that penicillin will exist triumphantly so long civilisation exists.

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2

Training of Orthopaedic Surgeons

SATYA PRAKASH KAUSHAL*

The tremendous increase of medical knowledge has made us retreat into many facets of it, to specialise with limited scope and objectives. Scott (1950) said "- ----- that this trend represents the progress of our times is undesirable- --- --". However, this trend in graduate surgical education in an unqualified manner may lead to a ridiculous degree of over specialisation of interests with extremely narrow perspectives and premature acquisition of skills on a trade school basis. In other words, specialisation from an early stage without fundamental training in principles of surgery will beget narrow perspective technocrats rather than "doctors".

The facilities available and vacancies present in our current medical care set up leaves much to be desired. Existing posts for "orthopaedic surgeons" in our zone of the country (Himachal, Punjab, Haryana and Chandigarh) outside the teaching institutes are only two viz., at Saket Hospital Chandi Mandir. No provincial or district hospitals have any post for orthopaedic surgeons. As alternatives of joining the armed forces, railways are there. The army does not recognise the training period for promotions, etc., and the antedate given in lieu of this period does not make up at par with our colleagues who joined the forces after M.B.B.S. and moreover the postgraduates do not get specialists' post in that organisation. Railways have a few vacancies, but for the last so many years none has been advertised, presumably they have already been filled. Expansion of existing departments in the teaching hospitals is neither economically feasible nor is in the interest of the general public as in this way the desired object of serving our scattered population as a whole is not fulfilled. The door to emigration is being closed slowly by our government as well as other countries, this escape route is being closed with the pretext of keeping the "talent" at home. Applications for the provincial posts are already oversubscribed and even if one is lucky to get such an appointment he will have to do much more than pure orthopaedics at such hospitals i.e., emergency surgery of all types, administration, family planning and public health work. Our training does not equip the candidates for any of these works.

Under these circumstances, is it worthwhile to mass produce orthopaedic surgeons or for that reason any other "pure" specialists? This is a trap, which one hopes, our overambitious planners do not fall into. Much can be said for closer integration and overall training before specialisation. "Early specialisotion has harmed sound surgical practice and has, perhaps, weakened the whole structure of surgery".

I hope, I am not being misunderstood. I recognise the need for specialists in our country. In any good medical set up, orthopaedics has been recognised as a speciality for a long time and traumatology is now being recognised as a science in its own right. In the past, these two have been considered as poor sisters of surgery in many centres. In quite a few, anybody is willing to have a go at playing the "bone setter." The courage of the "practitioners", "pahalwans" and "malishwallas" supplies us with a continuous stream of mishandled cases. Increase in longevity, interests in sports, motorised transportation and industrialisation are creating a demand for qualified orthopaedic surgeons all over the country. We don't have enough orthopaedic urgeon even to fulfil the need for rehabilitation of the disabled. Needless to say that the need for the specialists is there, but my plea is that we should give a broad base to their training. The profession, as a whole, should try to convince the authorities for the urgent need of providing facilities for specialists at least at district level. We should also try to mobilise public opinion for the same purpose.

Suggested changes—The training of surgical specialists should be preceded or accompanied by training in principles of "general surgery". The period of internship and house jobs should cover only limited amount of 'speciality' postings. The majority of this period should be spent in acquiring proficiency in general principles. The basic training should be arranged in such a way that residents aiming to specialise should work in complimentary sections for most of their training period, i.e., a future orthopaedic surgeon should also work in traumatology, plastic surgery, neurosurgery and vascular surgery; an aspirant to genitourinary surgery should also work in general surgery, plastic surgery and gynaecology. Everyone should have some experience in emergency surgery of all types, irrespective of what specialisation they are attempting. All surgeons should be trained so that they can safely tackle "universal operations" viz., appendicectomy, suprapubic cystostomy, strangulated hernias, fractures, osteomyelitis, etc.

Most of the teaching should be in the form of discussion groups, tutorials, practical training and minimal formal lectures.

This programme should be under constant review and changes should be made from time to time according to the changing patterns of society, available man power and facilities. The body which decides the pattern of training should include representatives of the employers, educationists and the students.

SUMMARY

Existing inadequacies in surgical speciality training are discussed, a plea is made to give a broad base to such

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training. It is suggested that authorities and employers should be approached to create specialist posts and facilities at district headquarter level.

ACKNOWLEDGMENT

Most of the material of this paper has been collected from discussion amongst my residents during informal dialouges, for this I sincerely thank them.

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NOTES AND NEWS

Rs. 400 Crores for Rural Health Services in Fifth Plan

Addressing the parliamentary consultative committee of his ministry, Sri R. K. Khadilkar, Union Minister for Health and Family Planning, recently said that the Union Government had planned to spend Rs. 400 crores in the Fifth Plan on providing minimum health services in the rural areas. The emphasis would be on preventive medicine, family planning and nutrition and the main thrust would be to make good the deficiencies in the existing medical services at the primary centres and sub-centres. It was proposed to upgrade 1,500 primary health centres to 30-bed hospitals in backward areas, he said.

Rs. 200 Crore Scheme for Drug Industry

An investment of more than Rs. 200 crores by both the public and private sector is envisaged in the Fifth Plan to increase the current production of drugs and pharmaceuticals in the country.

The plan target is to increase the production of drugs and pharmaceuticals from the present Rs. 300 crores to Rs. 600 crores by 1978-79, according to official sources.

Sunflower Oil Helps Sclerosis Patients

A group of British doctors have discovered that the addition of oil from the sun-flower seed aids the treatment of multiple sclerosis. *British Medical Journal* has recently reported.

Doctors of the National Hospital for Nervous Diseases in London and the Royal Victoria Hospital in Belfast and Professor Ephrain Field of Newcastle University have established that people with the complaint lack linoleic acid in their body and sunflower seed oil has a large proportion of the acid.

Brain 'Dies' Much More Slowly than Supposed So Long

The gulf that separates life from death is at least one hour and a half wide, according to Professor Klaus Zulch, Director of the Max Planck Institute for Brain Research in Cologne.

A young Cologne physician Dr. Hossman's experiments with animals have now established that the brain "dies" much more slowly than has been supposed.

Earlier it was believed that the brain gets irreparably damaged as soon as the blood supply is cut off.

The Cologne researcher has shown that a stoppage in the supply of blood to the brain leads to a shrinkage of the blood vessels leading to and from the heart. Even when the circulation is restored the blood vessels remain contracted. Experiments conducted on animals have, however, shown that this condition can be corrected by raising the blood pressure.

For three years Dr. Hossmann carried out a series of tests, stopping the flow of blood to the brain of laboratory animals and then after an hour or so restoring the blood supply usually by raising the blood pressure. In at least two third of these tests, the animals retained their blood cells undamaged. Within three hours the recovery was complete.

Scopolamine To Be Made from *Dhatura*

Efforts are being made to produce scopolamine indigently at Jammu from *dhatura*, a wild growing plant, whose extract has for long been misused by anti-social elements in various parts of the world. Currently being produced in Eastern Europe, scopolamine is an extremely poisonous drug which is used in minute doses as medicine for various purposes like control of shell-shock in wars or of tremors in Parkinson's disease and also used in delirium and psychotic conditions, in violent spasms in asthma and whooping cough, etc.

According to Dr. C. K. Atal, chief of the regional research laboratory at Jammu, of the three species found in India, two namely *dhatura innoxia* and *dhatura metel*, are proposed to be used for the manufacture of scopolamine.

The proposed Jammu factory is to be commissioned in November, 1973.

Heart Valves from Cadaver Used in Transplant

A team of doctors at the Sassoon General Hospital led by by Dr. A. V. Kanetkar claims to have successfully carried out for the first time in India two heart valve transplant operations using valves from a cadaver.

The patients were a 14-year-old boy and a 27-year-old labourer, whose crippled mitral valves were replaced by the team. Operated on 1-7-73, they looked healthy and moved about freely on 8-7-73 when they were produced before the Poona newsmen by Dr. G. S. Mutalik, dean of the hospital.

This homograft technique, which used a decorn tube instead of a metal ring to support the mitral valve, involved a much more laborious process than in putting in an artificial valve, Dr. Mutalik explained. The latter, however, gave rise to clot formation requiring a constant intake of anticoagulant drugs by the patients after the operation, while the homograft valve did not need any care, he explained.

Dr. Kanetkar later told newsmen that this operation was seldom attempted, as it was laborious and bore down one's patience. He said that, as far as he knew, only Dr. M. H. Yacoub of Harefield Hospital (England) and Dr. C. F. Kittle of Chicago Hospital (USA) had success fully performed this type of operation.

CORRESPONDENCE

The Editor is not responsible for the views expressed by correspondents

Consulting Physician

SIR,—In his letter to the Editor (*J. Indian M. A.*, **60**: 183, 1973) Dr. Musthafa has probed some facts which have bearing on the attitudes we, in India, have inherited from the British hierarchical system. This legacy is reflected in our deep-rooted, though wrongly placed, emphasis on degrees (may I call them a "tail"?) after a name. The longer the tail, the greater the respect commanded. That is the conclusion I draw when I look at some of the listings in the green pages of the Delhi Telephone Directory under the category "Medical Practitioners".

The two questions raised by Dr. Musthafa have a simple answer. Yes, they are both worthy of calling themselves consultants. I agree with Dr. M. V. Chari (*J. Indian M. A.*, **60**: 449, 1973) that a doctor without a postgraduate degree or diploma can certainly practise as a consultant if adequately trained. On the other hand, a doctor with a long "tail" can certainly function as a general practitioner if he so chooses.

Let us examine the system prevalent in U.S.A. All doctors obtain the basic degree M.D., which is equivalent to our M.B.B.S. Beyond that hardly anyone goes in for further postgraduate degrees even though several universities offer programs leading to such postgraduate degrees. Of course, every specialist has gone through the necessary period of postgraduate training in his speciality. After finishing the training one may appear in the certifying examination offered by the American Board of that particular speciality. A person who is adequately trained is board-eligible, i.e., eligible for the certifying examination. A person who has passed the certifying examination is said to be board-certified. That they are both equally qualified to be specialists and to practise as consultants, no one doubts. Even academic jobs in universities do not require one to be board-certified. As long as one is adequately trained one is considered qualified. This is regardless of the fact whether one is board-certified or only board-eligible.

Dr. Musthafa cites Dr. Simonson. I was at the University of Minnesota for seven years and can vouch for the fact although Dr. Simonson does not have a postgraduate degree in cardiology, he is one of the world's leading electrocardiographers and vectrocardiographers. I think Dr. Francisco Grande, basically trained as a physiologist, presents an even more illuminating example. Dr. Grande simultaneously holds three full professorial chairs at the University of Minnesota Medical School in the departments of physiology, nutrition and physiological hygiene!

At the other extreme we find ourselves here in India splitting hair—one may be adequately "trained" yet not properly "qualified" if one does have the right kind of "tail".

I am, etc.,

8/2, West Patelnagar,
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M.S. (MEDICINE, U.S.A.),
F.C.C.P. (U.S.A.)

OBITUARIES

Dr. A. J. Dave

Death took place of Dr. Amritlal J. Dave on 4-6-73 following a heart attack.

Dr. Dave qualified as an L.C.P.S. at Nair Hospital, Bombay, in 1935 and joined the Western Railways as an Assistant Surgeon. During the tenure of his service he was posted at Rajpur, Mahara and Bhavnagar.

A man of kind disposition, Dr. Dave was loved by his colleagues, staff and patients alike. He retired from service in 1968 and started private practice at Bhavnagar.

Dr. Dave was a member of the Bhavnagar Branch of I.M.A. in Gujarat since its inception. He leaves behind two sons and four daughters.

DR. A. J. DAVE

Dr. Ravi Varma

Dr. Ravi Varma, an eminent physician of Allahabad, passed away on 14-6-73 at the age of 58.

Dr. Varma qualified as an L.S.M.F. from Agra Medical College in 1937 and obtained his diploma in tropical medicine from Calcutta School of Tropical Medicine the following year. He started his professional life by joining the then Rampur State Services as medical officer. In 1946 he came back to Allahabad and set up private practice at the Muthiganj area of the town in 1950.

DR. RAVI VARMA

Dr. Varma joined the Allahabad branch of I.M.A. shortly after his settling down in the city. He was an active member of the branch till the closing years of his life. He was a member of the executive body of the branch for the year 1967-68 and helped the branch in various ways in promoting its sports activities as Sports Secretary for several years. Himself a renowned tennis and cricket player of his time, he donated a running trophy to the branch for hloding an annual cricket match between a team of private medical practitioners and a team of government doctors.

Dr. Varma is survived by his wife, a daughter and three sons, two of them Dr. Arun Varma and Dr. Sunil Varma now serving at Bareilly and at Allahabad respectively.

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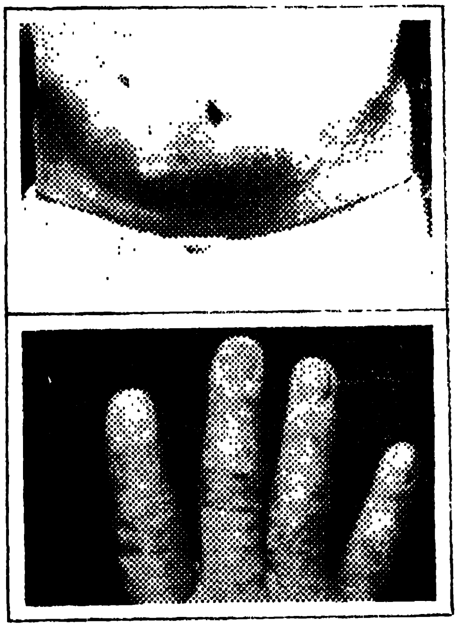

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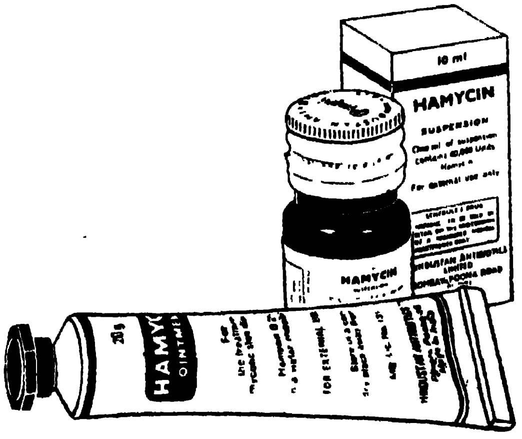

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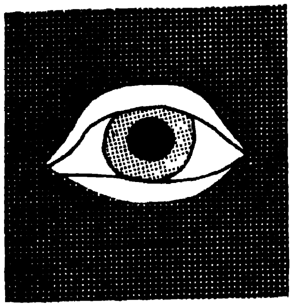

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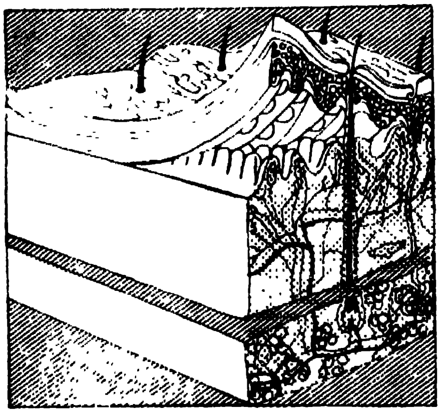

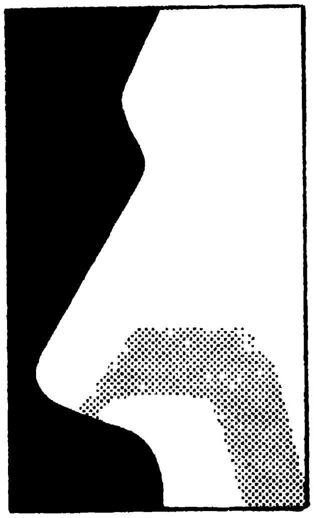

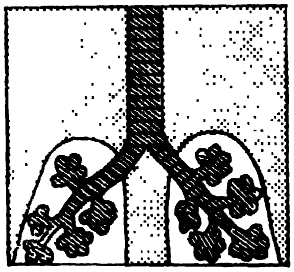

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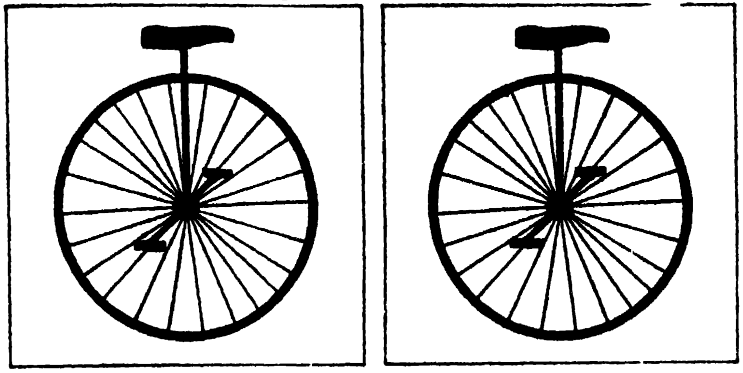

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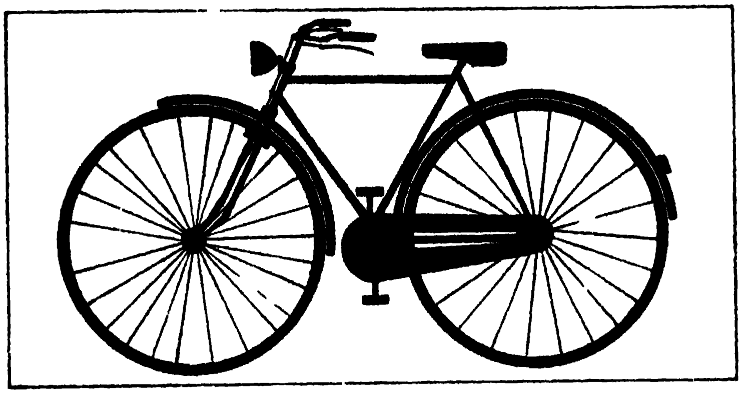

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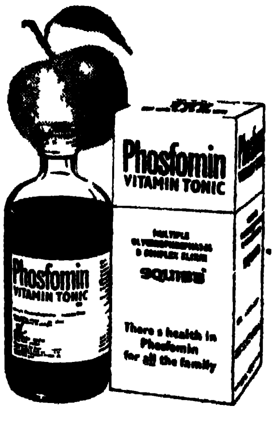

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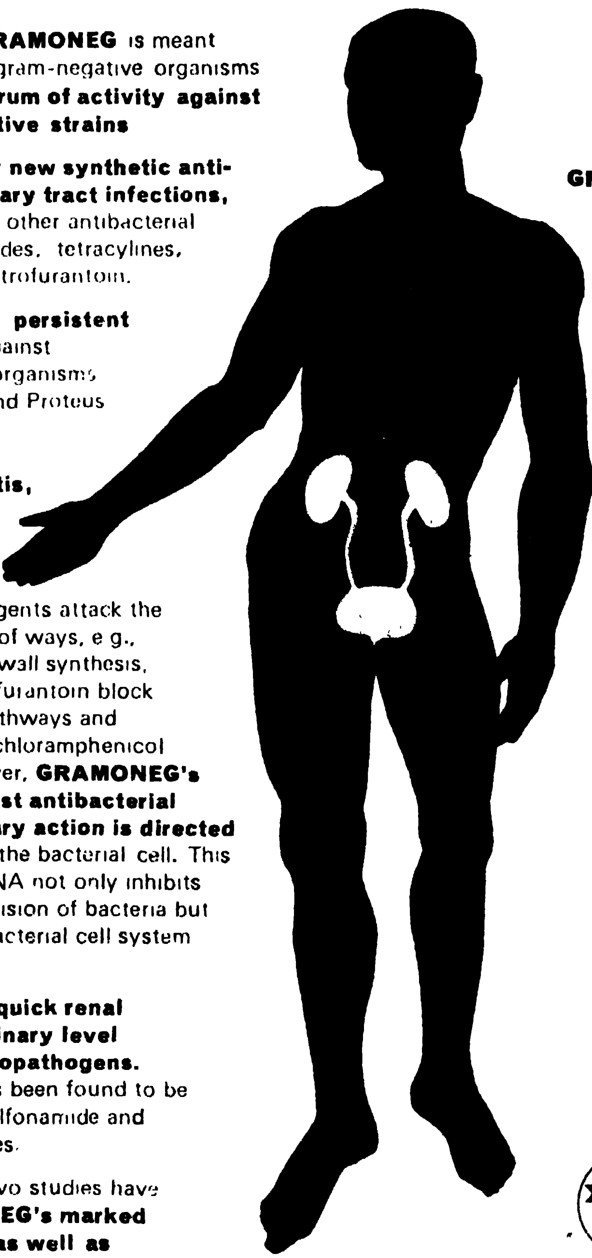

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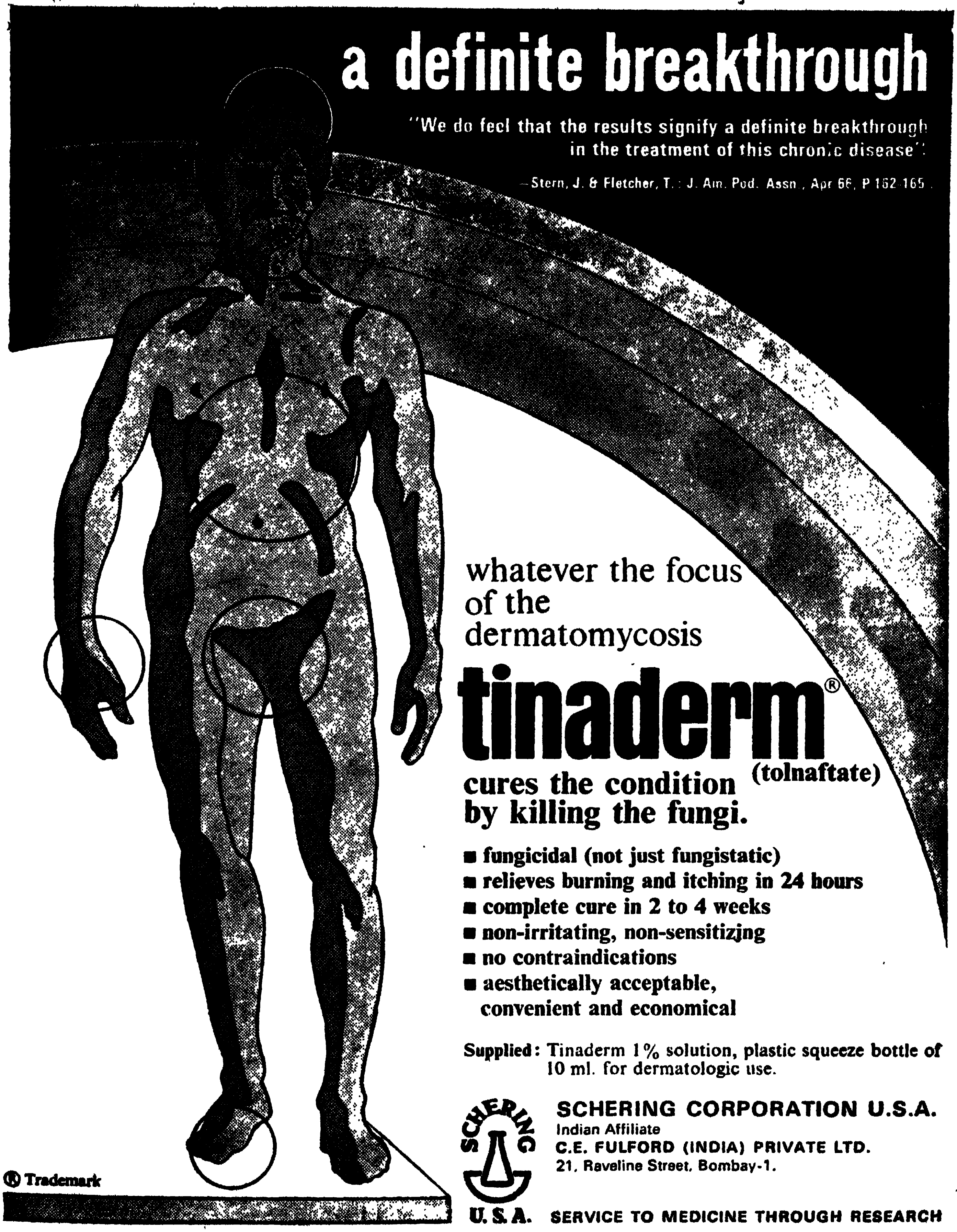

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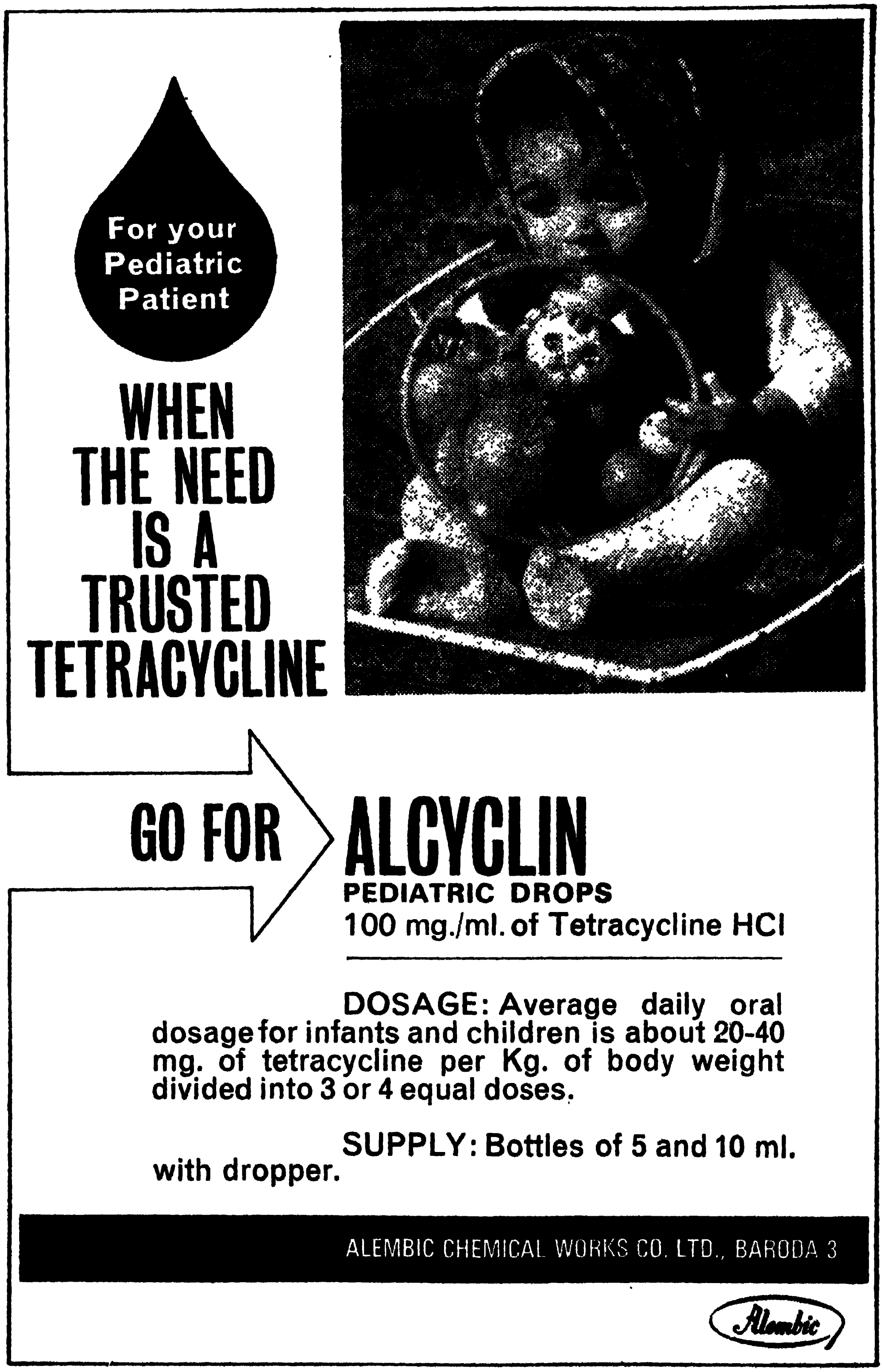

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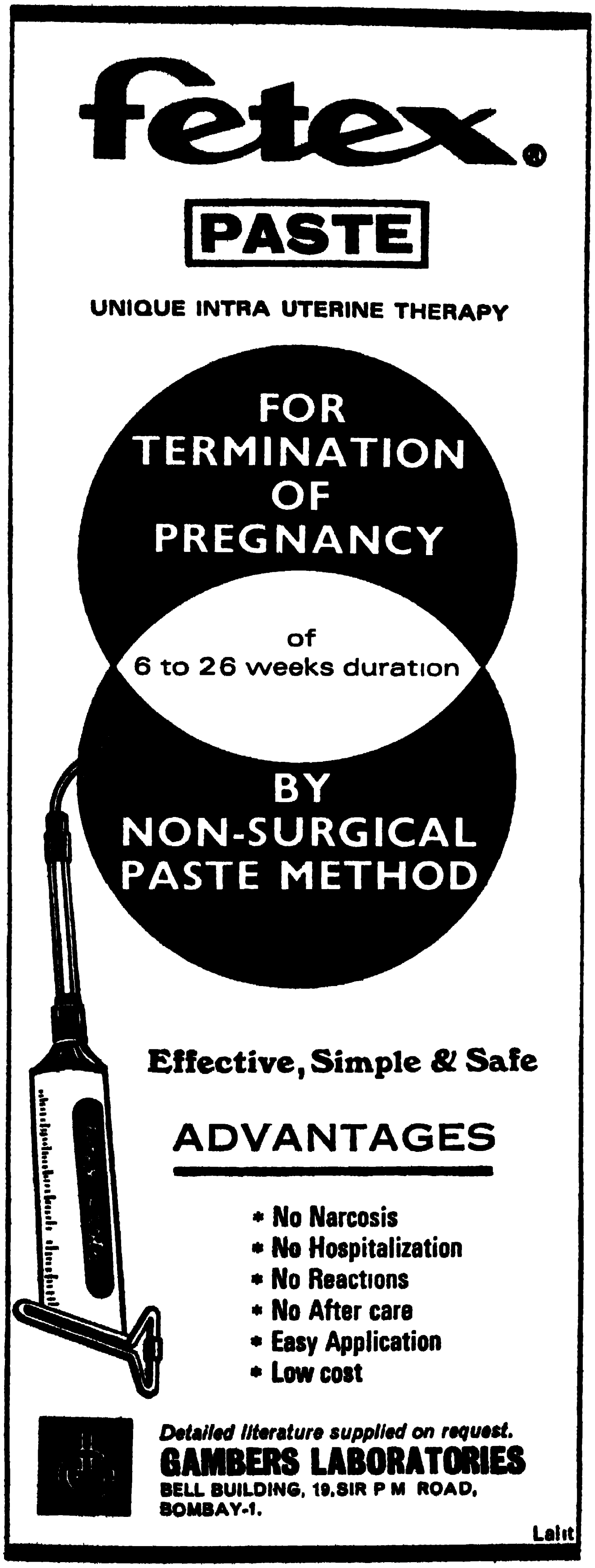

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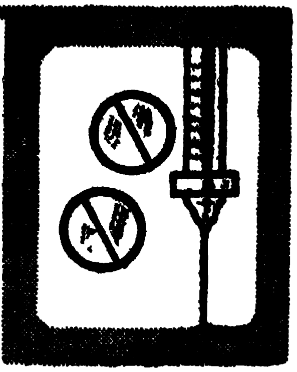

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In trying to meet our members' complaints of non-receipt of Journal we have found that those ue purely to postal irregularities are on the increase. Besides the very common cases of non-delivery r delivery of the Journal at the wrong address, we find that often copies are returned to us with ostal remarks like 'addressee left' 'not traceable' etc., but the wrappers of the same bearing the names and ddresses of the members concerned are mostly torn and mutilated. The result is that any kind of check up vith a view to detecting any omission or even suspending despatch of copies to avoid further loss becomes mpossible. Recently some of these returned packets were found to contain not the copies of the Journal but rash or altogether different materials Citing specific instances of such irregularities we have drawn the ttention of the postal authorities and sought suitable remedies therefor. To bring about a tangible improvenent in the situation we have already taken measures at this end to check carefully in each individual case of omplaint of non-receipt before mailing the Journal. We, however, feel that without a concerted drive nd maintenance of a regular pressure on the local post office this irregularity cannot be stopped. We ave already informed every Local Branch separately of the complaints that we have lodged with the postal uthorities against the deteriorating services.

We would request you to advise all Local Branch Secretaries under you and also individual members o be a little more vigilant about the regularity of postal clearance at their end. We hope all our dear members nd readers will extend their full co-operation in this matter. We would particularly request the Hony. State/ erritorial Secretaries to keep us informed of the result of at least one month's follow-up on the above lines.

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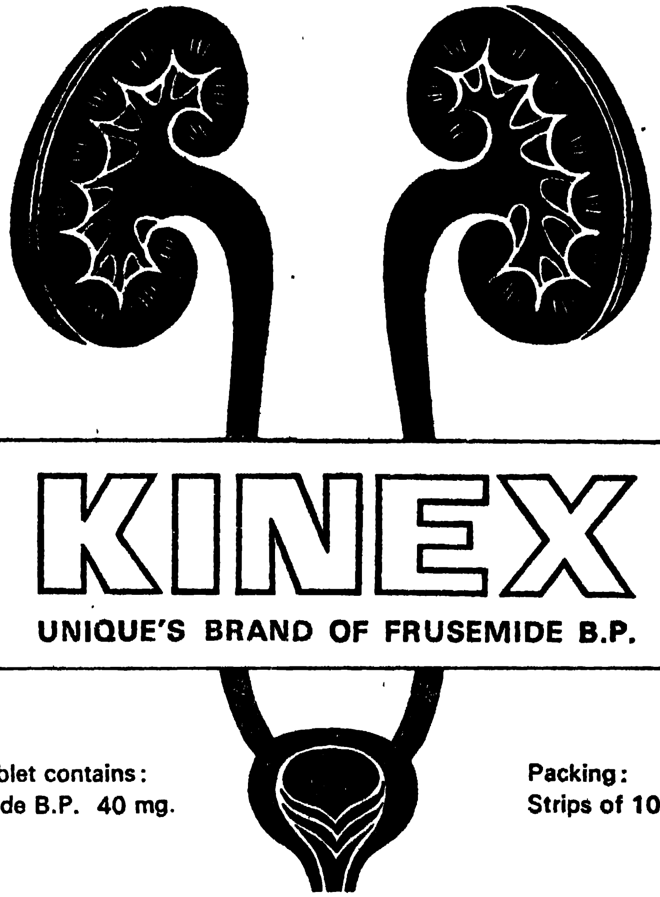

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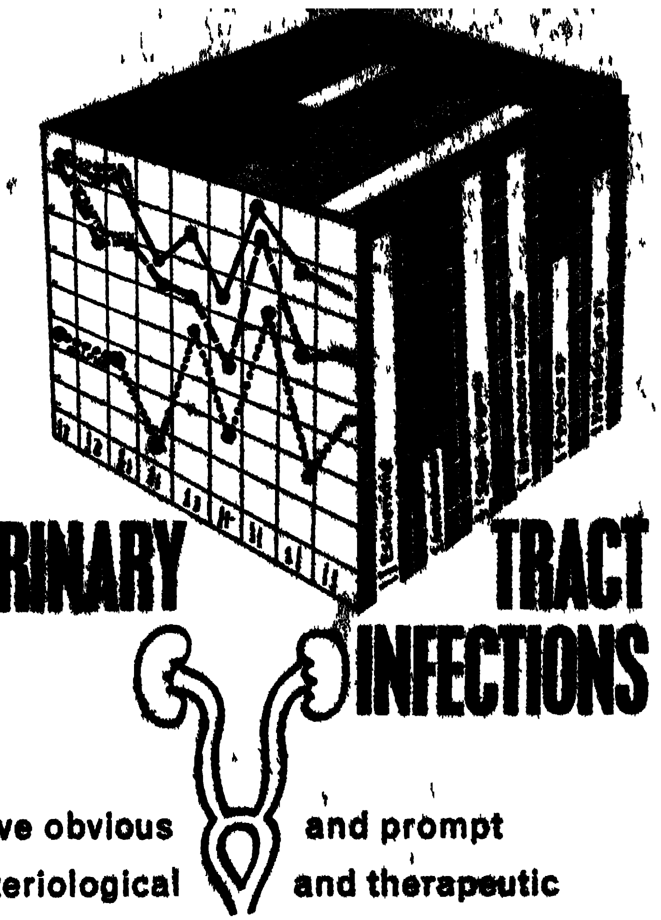

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TRUELOVE, S. C., WATKINSON, G., AND DRAPER, G.—*Ibid.*, **2**: 1708, 1962.

WATTS, J. MCK., THOMPSON, H. AND GELLIGHER, J. C.—*Gut*, **7**: 288, 1966.

CASE NOTES

1

Spontaneous Perforation of a Jejunal Diverticulum

S. B. AGARWAL*
N. ANANTHAKRISHNAN**
I. K. DHAWAN***

Solitary or multiple mesenteric diverticula may occur rarely in the jejunum and even less commonly in the ileum. Simultaneous involvement of both jejunum and ileum is a rare feature (Bockus, 1966). In fact Bewes (1967) states that jejunal diverticula are the rarest of gastro-intestinal diverticula. Cooke *et al.* (1963) reported the incidence of jejunal diverticula as being 1.25 per cent in 24,000 barium meal examinations, while Altemeier *et al.* (1963) found them to be present in 0.26 per cent of 19,000 autopsies.

CASE REPORT

A forty-one-year-old woman was admitted to the Emergency Services of the All India Institute of Medical Sciences for sudden, severe abdominal pain which started around the umbilicus and later localised in the right iliac fossa. The pain had been present for two hours prior to admission and was accompanied by vomiting. There was no previous history suggestive of peptic ulcer or enteric fever.

On examination, the patient was febrile (Temperature 100.5°F.) and pale. There was minimal abdominal distension with generalised restriction of respiratory excursions of the abdominal wall, generalised rigidity and diffuse tenderness, marked in the right iliac fossa. Liver dullness was not obliterated. Bowel sounds were absent. Rectal examintion showed tenderness of the recto-vaginal pouch.

A plain skiagram of the abdomen revealed gaseous small bowel distension and pneumoperitoneum. With a diagnosis of appendicular perforation, an emergency laparotomy was done. The peritoneal cavity contained about 1000 ml. of frank pus. The small bowel loops were oedematous and showed multiple mesenteric diverticula. The diverticula were extending from the duodeno-jejunal flexure to throughout the small bowel. The size varied from a few millimeters in diameter to as much as 3-4 cm. One of the diverticula about eight inches from the duodeno-jejunal flexure had perforated through a leaf of the mesentery. Because of extensive soiling of the peritoneal cavity and poor general condition of the patient, resection of the perforated loop was not attempted. A simple closure of perforation was done. Postoperatively the patient developed ileofemoral venous thrombosis which responded to thrombectomy. Distension of the abdomen, occasional vomiting and loose motions persisted. In the post operative period a barium meal examination was done, which showed, the diverticula involving the entire small bowel (Fig. 1, *vide* Plate). A month after discharge, the patient developed severe uncontrollable enteritis and expired in spite of energetic treatment.

DISCUSSION

Less than 5 to 6 per cent of patients with jejunal or ileal diverticula require active surgical interference for complications like massive haemorrhage, perforation or intestinal obstruction (Miller *et al.*, 1970). Spontaneous perforation with peritonitis of a jejunal diverticulum is a rare entity though perforation may follow trauma to the abdomen. Spontaneous asymptomatic pneumoperitoneum due to a slow, minute leak of a small bowel diverticulum has also been reported (Herrington, 1967).

The earliest reports of cases of perforation of a jejunal diverticulum was by Sommering in 1794 and Vioglet in 1804 (quoted by Fischer, 1900). Herrington (1962) collected 33 cases from literature and of these, four involved the ileum, three were perforations following blunt abdominal trauma and one case was a spontaneous asymptomatic pneumoperitoneum. Elliot *et al.* (1965) reviewed 25 cases of spontaneous perforation of jejunal diverticulum reported by Herrington (1962) and added a case of his own. Subsequently a few more instances of spontaneous jejunal diverticular perforations have appeared in the literature (Bewes, *loc. cit.*; Bhargava *et al.*, 1968; Nobles, 1971).

The symptoms and signs of jejunal diverticular perforation are indistinguishable from those of a perforated duodenal ulcer with symptoms being predominantly in the upper abdomen with no antecedent history of small bowel dysfunction. The rarity of complications of jejunal diverticula has been explained by Thorek and Manzanilla (1954).

Management should always be surgical. The ideal procedure is resection of the entire segment containing the diverticula. If the diverticula are widespread or in cases of acute emergencies like diverticular perforation or haemorrhage, resection of the segment has been advocated (McIlrath and Sterling, 1967; Elliot *et al.*, *loc. cit.*). Diverticulectomy or simple closure of the perforation is better avoided as the diverticulum being mesenteric lacks a peritoneal coat and adequate closure is difficult.

Diarrhoea is a well known feature of small bowel diverticula. It is usually attributed to hypermotility secondary to diverticula (Bockus, *loc. cit.*). On occasions diarrhoea may be profuse leading to electrolyte depletion and progressive intestinal distension which may precipitate volvulus (Cooke *et al.*, *loc. cit.*).

SUMMARY

A case of spontaneous perforation of a jejunal diverticulum is reported. The literature on the same is reviewed.

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2

Forgotten Bronchial Foreign Body

B. M. ABROL*, A. K. CHATTOPADHYAY**

A long standing intrabronchial foreign body may pose problems in diagnosis and management. The manifestations are different as compared to a recent inhaled foreign body.

Lewin (1945) reported a case of intrabronchial foreign body of 31 years duration. Jackson and Jackson (1950) reported 200 cases of foreign bodies of the bronchus. Their duration varied from one month to forty years. Boettner (1952) reported 2 cases of 1½ years and 4 years duration respectively. MacGowan (1952) and Roy *et al.* (1970) reported different types of foreign bodies of varying duration. Most of the foreign bodies cause immediate symptoms and signs and may either be coughed out or get lodged. Some of the patients forget about the inhaled foreign body and present with different and unusual manifestations as in the present case.

CASE REPORT

M.L., a muslim, male, aged 12 years was admitted to the A.I.I.M.S. Hospital on 17-2-1971.

He presented with dry cough, pain in the left side of the chest, fever off and on for last 2 years. He had passed streaks of blood with sputum 2-3 times. There was no history of trauma or aspiration of foreign body, no history of dysphagia or loss of weight. He was having antituberculosis treatment for pulmonary tuberculosis, because tuberculosis is common in India, general practitioners often diagnose and treat such cases as tuberculosis, based on a P.A. view of skingram chest only.

The general physical examination revealed nothing significant.

Examination of chest revealed slight diminished movement of left lower part of the chest with diminished vocal fremitus over that area. Percussion note was impaired in left lower part of the chest. Air entry in this part of the chest was diminished.

The routine investigations of blood and urine were within normal limits. No A.F.B. were seen in the sputum.

X-ray chest—The foreign body was not visualised in P.A. view. A radio-opaque foreign body was seen in the lateral view in the left main bronchus which appeared to be a shoe-nail with the thick top. The sharp end was presenting whereas the top was trailing. Besides, there was a collapse of left power lobe (Fig. 1, *vide* Plate).

Treatment—Bronchoscopy was done on 20-2-1971. Jackson's 8/40 bronchoscope was introduced under G.A. There were plenty of mucopurulent secretions in the tracheobronchial tree mainly in the left bronchus. The larynx, carina and right main bronchus were normal. Left main bronchus showed marked oedema, congestion and granulation tissue just below the taking off of the upper lobe bronchus. Thick mucopurulent secretions were sucked out and granulations partly removed after decongestion with adrenaline soaked swabs, to have a good view of the foreign body. A cobler's shoe-nail was visualised which appeared as dark gray and obliterating the entire lumen of left lower lobe bronchus. It was impacted and could not be removed on peroral endoscopy. In view of the long standing history, irreversible collapse of lower lobe, as well as impacted nature of the foreign body, it was decided that it should be removed *via* thoracotomy. The granulations sent for histopathology showed no evidence of tuberculosis.

In spite of advice and persuation, the parents of the patient did not agree for thoracotomy and the patient was taken away on 22-2-1971 against medical advice.

DISCUSSION

A long standing foreign body in the bronchial tree may present with different manifestations. There may not be any history of an episode of choking, coughing, cyanosis and dysponea, as the patients often forget the same.

Thus a patient of long-standing bronchial foreign body may present with the features of pulmonary tuberculosis, as in the present case.

Diagnosis of a case of bronchial foreign body may become difficult sometimes due to i) Absence of history of aspiration of foreign body as it is often forgotten. ii) Non-opaque foreign body. iii) Even on roentgenological examination it may be under the heart shadow and dety identification.

SUMMARY

A case of long-standing foreign body bronchus which simulated pulmonary tuberculosis, bronchiectasis, and atelectasis is presented.

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Liver Scan and Metastatic Cancer

Liver is the largest organ in the body and is supplied by a quantity of blood approximately equivalent to one-fourth of the cardiac output. This supply comes *via* dual afferent sources, the portal vein and the hepatic artery. The metabolic, excretory and phagocytic activities of the organ, in addition, enable it to contribute diversely to bodily homoeostasis. Consequently, diffuse parenchymal diseases give rise to early systemic manifestations in contrast to focal lesions which may remain clinically occult unless well advanced, due to the organ's unparalleled reserve capacity and regenerative capability. Since almost all the splanchnic venous outflow passes through the organ, the commonest focal lesion is the metastasis from intra-abdominal neoplasm[1].

A number of methods is in practice to delineate focal lesions of liver. Clinically this is limited up to the inferior margin of liver. Information by conventional radiography is largely obviated by the homogeneous opacity of liver parenchyma[1]. Hepatic function tests, in general, do not correlate with the presence of intrahepatic mass lesion excepting perhaps the serum alkaline phosphatase level[2,3,4] which is of value if the previous levels are known. Selective coeliac-arteriography, spleno-portography, inferior venacavagram and retrograde hepatic venography are, however, useful in visualising focal defects including metastatic lesions[5] but are specialised procedures with potential morbidity.

The diagnostic accuracy of needle biopsy, although high in diffuse lesions, is relatively less representative for focal lesions. Moreover, the technique is not without risk and complications[5]. With the advent of hepatic scintillation scan most of the above difficulties have been surmounted and is now an acceptable method for screening and detecting intrahepatic space occupying lesions.

The earliest attempt to detect metastases in liver was made using radio-iodinated human serum albumin and a manual point-to-point counting[6]. This, however, proved inadequate and was soon replaced by radioactive colloidal gold using a mechanical scanner[7] when it was observed that space occupying lesions in liver appear as negative or 'cold' areas in scan. Subsequently successful scanning with radio-iodinated rose bengal was reported[8]. Hepatic morphology is, however, equally well delineated by these two generically distinct tracers. A few years later the possibility of liver scan with radioactive technetium as sulphur colloid was demonstrated[9]. Colloidal tracers although provide stable count rates compared to radioactive dyes have the disadvantage of being deposited in extrahepatic reticulo-endothetial tissue which at times, however, has the advantage of providing additional information. The major advantages of newly introduced short lived radio-colloids are sharp improvement in counting statistics and radiation dosimetry. However, uptill now no unanimity could be reached as to the most satisfactory radiopharmaceutical for liver scanning.

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A large volume of literature is now available attesting the usefulness of liver scan in the detection of metastatic deposits. In a comparative review of 950 hepatic scan using I^{131} rose bengal, in patients with known cancer and the results with the findings at operation or autopsy in 402 positive scans and 128 negative scans, the positive scans were 83 per cent and 88 per cent correct. Only 14 of the 69 patients with false-positive scans had normal liver architecture, the rest having diffuse involvement as cirrhosis or fatty metamorphosis[10]. Although, only 3 false-positive scans were found in 129 abnormal scans[11] the number of false negatives were much more, reaching nearly 20 per cent in 101 established cases. Literature published in this direction until 1966 shows that nearly 80 to 90 per cent cases of proved metastasis are detectable by scanning and has an accuracy higher than enzyme studies, other liver function tests or blind hepatic punch biopsy[12]. The incidence of false positive scan is 10 to 20 per cent.

It has been reported that among patients with metastatic cancer, scan is less accurate than alkaline phosphatase and bromosulphthalein estimations[2]. Most inaccurate diagnoses by scan were false positives. Diagnostic accuracy of needle biopsy was of the same order as that of the scan. The scan is most useful in single discrete lesion and least in uniformly distributed lesion where punch biopsy is more useful[13]. During 1963-68, out of a total of 399 liver scans done on 386 patients most of the patients had carcinomas of lung or oesophagus[3]. Of 152 patients with scans positive for space occupying lesions, 59 had an unequivocal correct diagnosis. There were 9 false positive scans. Of 202 cases with negative scan for mass lesions, only 167 had false negative scans and 62 patients with normal liver scans were considered operable and had resectable lesions. According to these authors[3] the accuracy of liver function tests, even alkaline phosphatase and bromosulfthalein estimations, did not approach that of liver scanning. Further, function tests are ineffective in detecting localised nature of the disease but may be of use in conjunction with scan. Another interesting report evaluating results of liver scanning combined with liver function tests showed that liver scan and serum alkaline phosphatase estimation were 78 and 80 per cent correct, respectively, in detecting hepatic neoplasm. Only 1 out of 45 patients, in the series, without such a tumour had both a positive scan and a raised alkaline phosphatase level. When results of both investigations were positive, hepatic tumour was found in 11 out of 12 patients; and when both were normal only 1 out of 23 patients had a tumour[4]. In another study it was observed that among 77 patients with histologically confirmed extrahepatic primary tumours and 2 with suspected hepatomas 50 had positive liver scan[14]. Two patients with histologically normal liver had positive scan and one with a liver lesion had a negative scan. The observers, however, used Induim (113m) as tracer for liver scan.

Although, metastatic lesions may be interpreted with relative ease as multiple circumscribed defects in the liver scan the interpretation become difficult sometimes even in normal liver with normal variations. Another difficulty encountered is that besides technical errors a lesion smaller than 2.5 cm. at a depth of 10 cm. within the liver and 1.7 cm. on the surface of the liver are considered beyond the limits of resolution of present-day scanners[12]. Agenesis of the left lobe of liver is again another source of confusion and is liable to be confused with a space occupying lesion in that area[15]. Decreased concentration found in the gall bladder area following cholecystectomy, possibly due to fibrosis, is yet another difficulty to hepatic scan interpretation[16].

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Perhaps the most probable reason for such difficulties is that conditions that cause focal intrahepatic filling defects including metastatic lesions are many and all focal lesions, benign or maligant, form non-radioactive 'cold' defects in a two dimensional hepatic scan. Were the reverse true, more so with preferential uptake of radiopharmaceuticals by neoplastic tissue, detection of focal lesions would have been much easier since scanning resolves small active areas more easily than corresponding cold areas[1]. As such it is impossible to distinguish benign from maligant lesions by means of scan. Occasionally, a diffuse disease of the liver such as cirrhosis may be non-uniform and mimic focal lesions[12]. In such circumstances, however, scanning after administration of both rose bengal and colloidal particles may help to clarify the situation. Liver scan for detecting metastatic lesions is further complicated by the fact that cirrhotic livers may be the site of hepatomas as well as metastases from intra-abdominal malignancies[17] and also that due to relatively labile nature of hepatic tissue, extrahepatic masses may impinge on the liver, alter its border to simulate a space occupying lesion. In spite of the information already available and the difficulties encountered, the work published elsewhere in this issue of the Journal[18] still another attempt in the same direction perhaps to impress primarily the beginners in this field that 'a normal liver scan in a patient with known primary extra-hepatic cancer does not exclude hepatic metastasis'. With the improvement in technology, nature of radiopharmaceutical and development of newer isotopic methods it is hoped that liver scan will throw further light into this problem.

BIJON ROY

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CURRENT MEDICAL LITERATURE

Propranolol in Essential Tremor

MURRAY, T. J. (*Canadian Med. Ass. J.*, **107**: 984, 1972) from Victoria General Hospital, Halifax, N.S. writes :

Although the nature and mechanism of essential tremor have been controversial over the years, there has been general agreement that no useful therapy is available. Those who related the disorder to Parkinson's disease found anticholinergic drugs and levodopa to be of no value. Those who noted a striking relationship to anxiety and emotion were disappointed in the lack of response to sedatives, tranquillisers and antidepressants.

The addition of propranolol to the therapy of essential tremor may be a further step towards a safe and effective treatment where there was none before.

This paper presents a preliminary study of 12 patients with essential tremor, all of whom had good or excellent suppression of tremor on a moderate dose of propranolol. Whether this beta-adrenergic blocking agent acts centrally on the nervous system or peripherally at the beta receptors remains uncertain. If certain respiratory and cardiac contraindications and precautions are observed, propranolol promises to be an effective form of therapy for this disorder, the treatment of which has hitherto been unsuccessful.

Levodopa Therapy

SCHWARTZ, A., ROSENBERG, G., SPENCER, A., BARBEAU, A., MARS, H. AND LIBMAN ISRAEL (*Canadian Med. Ass. J.*, **107**: 973, 1972) from Maimonides Hospital and Home for the Aged, Montreal, observe :

Eighty-eight patients with Parkinson's disease were treated with levodopa. A group of elderly patients 65 years and older was compared with a second group under the age of 65, and it was found that generally the younger patients could be treated with greater success than the older ones. Most of the elderly could not tolerate the large doses required to produce optimal physical recovery. Severity of complications forced discontinuance of treatment in a larger percentage of elderly patients. The rate of complications was about equal in the two groups, except the incidence of confusion, which was significantly higher in the elderly. Of the two deaths that occurred, both were in the older group. Results of treatment were better in patients whose families gave positive support.

Levodopa Combined with Peripheral Decarboxylase Inhibition in Parkinson's Disease

BARBEAU, A., MARS, H., BOTEZ, M. I. AND JOUBERT, M. (*Canad. Med. Ass. J.*, **106**: 1169, 1972) from the Department of Neurobiology, Clinical Research Institute of Montreal, Hotel-Dieu Hospital and Department of Medicine, University of Montreal, Quebec, observe :

The authors report their experience, over a 26-month period, in the management of 60 parkinsonian patients with the combination of levodopa and an inhibitor of peripheral dopadecarboxylase, Ro 4-4602. This approach to Parkinson's disease is useful, safe, and at least as effective as levodopa alone. To date, there have been no recognisable toxic effects attributable to Ro 4-4602. This agent appears to prolong the duration of action of levodopa, smoothing out its therapeutic effects. The percentage of patients obtaining a very good and excellent response is slightly increased. There is a possible diminution in the late-occurring bradykinetic and hypotonic freezing episodes. Nausea and cardiac arrhythmias are lessened, as are the incidence and severity of hypotension. Abnormal involuntary movements remain the limiting adverse side effect.

Progressive Supranuclear Palsy

Steel, J. C. (*Brain*, **95**: 693, 1972) from 157 Collier St., Toronto 5, Canada, comments :

The experience of the past eight years has shown that the nosological entity, which was considered an unusual syndrome in 1964 and termed progressive supranuclear palsy, is clearly a unique and not uncommon disease of middle and later life.

Four cases of the disease are described in this article, two of whom were still alive at the time of the 1964 report but have since died.

The clinical syndrome is that of slowly advancing supranuclear gaze palsy which may progress to total ophthalmoplegia, pseudobulbar palsy, axial dystonia in extension, and dementia. The histopathological changes are neurofibrillary degeneration, granulo-vacuolar degeneration, nerve cell loss and gliosis, and they have a distinctive localisation to nuclei of the brain-stem, diencephalon and cerebellum.

The aetiology of the disease is unknown, but for the present it must be considered a central nervous system degeneration of middle and later life. The diagnosis should be considered in patients when signs of rigidity without tremor, of dementia, of pseudobulbar palsy or axial dystonia, co-exist with ophthalmoplegia. Ophthalmoplegia should be looked for when these symptoms exist.

Attempts to transmit the disease to primates have so far been unsuccessful. Because of Klatzo's production of neurofibrillary degeneration by alum phosphate it would be of interest to measure cerebral trace metals in this disease.

Marijuana and Mutism

Marcotte, D. B. (*Amer. J. Psychiat*, **129**: 475, 1972) from the Department of Psychiatry, Medical University of South Carolina, 80 Barre Street, Charleston, S.C. 29401, writes :

The development of an inability or an unwillingness to communicate verbally after inhaling marijuana is incidentally reported in the literature. The author cites four cases in which mutism is associated with the inhalation of hashish. There was evidence of organic brain syndrome in all patients. By inference, organic brain syndrome and mutism are thought to be dose-related effects of inhaling marijuana.

Metabolic and Ventilatory Changes in Asthmatic Patients

Anderson, S. D., Silverman, M. and Walker, S. R. (*Thorax*, **27**: 718, 1972) from the Department of Paediatrics and Asthma, Research Council Clinical Pharmacology unit, Department of Medicine, Institute of Diseases of the Chest, Brompton Hospital, London S.W.3, observe :

Five asthmatic patients aged 25-30 years were studied during and after 6-8 minutes of steady exercise on both a bicycle ergometer and a treadmill. For each patient the duration of work, oxygen consumption, minute ventilation, and heart rate were similar in each form of exercise.

During exercise all patients had an increase in peak expiratory flow rate. The blood lactate level was higher during bicycle exercise but arterial PCO$_2$ and pH fell to similar levels during both forms of exercise. There was a rise in arterial oxygen tension in four of the patients during exercise ; in one subject arterial oxygen tension fell.

Bronchoconstriction was greater following treadmill exercise in all subjects and was associated with an increase in ventilation/perfusion inequality, as shown by arterial hypoxaemia, an increase in alveolar-arterial oxygen tension gradients, and an increase in physiological dead space. In one subject whose P.E.F.F. fell to 25 per cent of the predicted value CO$_2$ retention occurred. These changes are similar to those found in other forms of acute asthma.

In one subject, during both forms of exercise the mixed expired PCO$_2$ was observed to be higher than the arterial PCO$_2$, thus giving a negative value for physiological dead space.

Maternal Attachment

Klaus, M. H., Jerauld, R., Kreger, N. C., McAlpine, W., Steffa, M., and Kennell, J. H. (*New Eng. J. Med.*, **286** : 460, 1972) from the Department of Paediatrics, School of Medicine, Case Western Reserve University, Cleveland, observe :

To determine whether present hospital practices may affect later maternal behaviour, we placed 28 primiparous women in two study groups shortly after delivery of normal full-term infants. Fourteen mothers (control group) had the usual physical contact with their infants, and 14 mothers (extended contact) had 16 hours of additional contact. Mothers' backgrounds and infants' characteristics were similar in both groups. Maternal behaviour was measured 28 to 32 days later during a standardised interview, an examination of the baby and a filmed bottle feeding. Extended-contact mothers were more reluctant to leave their infants with someone else, usually stood and watched during the examination, showed greater soothing behaviour, and engaged in significantly more eye-to-eye contact and fondling. These studies suggest that simple modification of care shortly after delivery may alter subsequent maternal behaviour.

The Hyperbaric Chamber and Pulmonary Oxygen Toxicity

Lipton, B., Toth, A. and Jacobson II, J. H. (*Mount Sinai J. Med.*, **40** : 7, 1973) from the Departments of Anaesthesiology, Pathology and Surgery, Mount Sinai School of Medicine of The City University of New York, N. Y. 10029, comment :

This study is a retrospective survey of patients sent to the hyperbaric chamber of the Mount Sinai Hospital, New York City in severe respiratory failure. Of thirty patients only eight survived, five probably because of the use of intermittent hyperbaroxia. One patient was treated by means of extracorporeal oxygenation with a membrane oxygenator for thirty-six hours. Post-mortem examination of his lungs indicated that oxygen toxicity had already progressed to the irreversible proliferative phase. Thirteen post-mortem examinations in patients who had had prolonged oxygen therapy revealed toxic pulmonary lesions described as exudative, intermediate and proliferative. The use of corticosteroids may prevent the development of the proliferative phase. The aetiology and prevention of pulmonary oxygen toxicity is discussed. Extracorporeal blood oxygenation by means of venovenous bypass and a disposal membrane oxygenator may be used to treat acute respiratory failure in patients where there is insufficient functioning lung tissue to support life or where pulmonary oxygen toxicity has been superimposed on the original disease process.

CURRENT TOPIC

Appendix Vermiformis : Scapegoat of the Abdomen !

SUBODH DATTA*

> Every man is a debtor to his
> profession and ought of duty to
> endeavour to be a help thereunto.
> —Lord Bacon.

The High Priest of the Jews, dispensed absolution to the people, once a year, by symbolically laying their sins on a goat. The goat was then allowed to escape into wilderness.

In the early years of medicine, the vermiform appendix, because perhaps of its insignificant size did neither capture the attention nor the respect of the profession. Values of things change with age. Notoriety has been thrust on the appendix to-day. Whenever the causes of the disorders of the abdomen, particularly if they are chronic, are not readily clear, the appendix becomes the first suspect.

The other day a healthy young man was advised to have his appendix taken out because of a swelling on the right side of the lower part of his abdomen with the remark that he had an atom bomb in his abdomen which might explode any time. The frightened man had an interstitial hernia with appendicism (symtomatic uneasiness in the region of the appendix). The lucky goat was allowed to escape, but the unoffending appendix has often times to face the surgeon's knife after being condemned as "chronic appendix".

A knowledge of anatomy, physiology and pathology of an organ (or tissue) is an indispensable preparation before trenching on the clinical aspects of the diseases of the organ.

Anatomy deals with the form, structure and relations of organs. Physiology deals with the normal vital processes of the living organism, or as the Berne physiologist, Albrecht von Haller (1708-77) had held "physiology is but animated anatomy". Pathology is a study of lesions and disease processes; it deals with disease in all its relations, especially with its nature, with the functions and material changes caused by it. It is the sum of the morbid changes in any disease. Pathology follows the process from the inception to its termination. Friedrich Hoffmann, the pathologist of Halle (1660-1742), was the first to perceive that pathology begins as altered physiology. Alterations in anatomy become discernible with the progress of the disease. These changes by their impact on the system, give rise to subjective and objective manifestations, in the study of which the clinicians and pathologists are engaged. Their combined efforts help in correlating pathogenesis to the clinical picture, by which the disease is recognised. Diagnosis is the first step in the successful treatment of the disease.

External anatomy, both human and animal, was familiar to the pre-historic man as evidenced by their statuettes and carvings of man and animals, on stones and bones. The earliest known representation of human figurine, unearthed by the German Szombathy in 1908, is that of a 4½ inch high lime stone statute of a Palaeolithic woman (about 22,000 B.C.). Early Greek anatomy was also external; Greek sculptors gathered anatomy from the naked bodies of athletes in action and repose. Clifford-Allbutt (Sir Thomas Clifford-Allbutt, Regius professor of physic, Cambridge, 1836-1925) wrote that Homer (great poet of Greece, c. 850 B.C.) in his Iliad "records each stab with anatomical precision".

Before dissection came into practice, knowledge of internal human anatomy was inferred from the examination of sacrificial animals and animals slaughtered for food. Egyptians had opportunities of learning human anatomy in the course of embalming process. Egyptians of pyramid days, removed the viscera during mummification and kept them in four Coptic jars (Copt is a Christian descendant of ancient Egyptians). Some of these jars had inscriptions on the exterior referring to the "worm" (? appendix) of the bowel. *Hermetic Books of Thoth* (Thoth was the ibis headed god of art and science of ancient Egypt) contain statements that probably refer to the appendix.

Hindoo surgeon Sushruta (circa 500 B.C.) had enjoined dissection of the human body for the prospective surgeon and laid down directions for carrying out the same. The dissectors were called *Purusachettas* in ancient India. The bodies for dissection were usually of children below 2 years of age, for according to the injunction of the *Shastras*, corpses of persons over 2 years of age had to be burnt. There is no mention of any structure resembling the appendix.

Greek votive offerings at Cos and Cnidus have been found with crude efforts to represent the appendix in the coils of the intestines.

Aristotle's (of Stagira, 384-322 B.C.) anatomy was of lower animals.

Western writers hold Herophilus (c. 300 B.C.) the Alexandrian anatomist as the originator of dissections. He named certain structures of the body like duodenum, prostate, etc.,—terms still in use, but there is no reference to appendix.

Celsus (Aurelius Cornelius Celsus, a wealthy Roman gentleman, not a physician, 25 B.C.—50 A.D.) who wrote a great deal on medicine, possibly discovered appendix for he was permitted by Tiberius Caesar to dissect "executed criminals".

Galen's anatomy (or Galenasi Claudius, the great Greek physician, 131-201 A.D.) is defective for his anatomical studies were confined to lower mammalian orders. His anatomy however, reigned supreme for over a thousand years such was the standing of Galen. Appendix, comparable to that in human beings, occurs first in anthropoid apes. Both Aristotle and Galen were ignorant of the appendix, as was Aristotle's teacher Plato.

Dissection, first strictly proscribed by law, became more and more a matter of routine following the decree of Emperor Frederick II in 1240.

Mondino de' Luzzi (better known as Mundinus of Bologna ? c. 1270-1326) was the first real anatomist. He re-introduced the teaching of anatomy on human cadavers. He performed post-mortem examination on 2 female cadavers in 1315 to ascertain the relative size of the uterus in virgins and multiparae. This has been held as the first post-mortem examination ever held. Post-mortem examination was practised by the ancient Hindoos. The difficulty in Sanskrit literature is that discussion of medical matters are not confined to *Ayurveda* but is scattered all over from the *Vedas* downwards. Post-mortem examination is mentioned in *Arthashastra* of Kautilya as *Ashumrtaka-*

Calcutta

*M.B., F.R.C.S.E., L.M. (Dub.), F.S.M.F.

pariksha (examination of bodies of men who have recently died). Report of such examination was necessary in higher courts of law—*Kantakasodhana* court—during the reign of Chandragupta (316-290 B.C.). In an "Examination Room" bodies of cases of accidental death, homicidal, suicidal by hanging or poisoning, were kept immersed in oil or oleaginous preparation to prevent this decomposition.

Berengario da Capri of Bologna (1470-1550) gave the first written account of the processus vermiformis in 1524.

There were plenty of dissectors and dissections before the Flemish Andreas Vesalius of Padua (1514-64), but it was he alone who made anatomy what it is to day—a living, working science. His master work *De Fabrica Humani Corporis* was published in 1543 and marked an epoch in breaking with the past and throwing overboard the entrenched Galenic tradition. He wrote "My highest wish is to be able to study the true Bible of the human body and of the nature of man". Vesalius described the appendix as "caecum" because it is a blind pouch (from Latin *caecus* meaning blind).

Laurentine in 1600 compared the appendix to a twisted worm. Verheye (Philippe Verheye, Flemish anatomist, 1648-1710) coined the term "vermiform appendix" in 1710

Between the 7th and 8th week of intra uterine life, a minute process is usually seen at the tip of the caecum in the human embryo. This bud may have a distinct lumen communicating with the caecum; more often it is only a mass of cells While the caecum goes on growing, this bud gradually atrophies and disappears, as is very common in embryonic life for structures to form and disappear. The bud sometimes persists as a duplicate of the appendix. Kelly (Howard Atwood Kelly, Philadelphia gynaecologist, 1858-1943) says that the future appendix and its mesentery carrying an artery are definitely discernible in the embryo about the 2nd and 3rd months of intra-uterine life. Human embryology shows that the appendix is a retrogressive organ and does not maintain the degree of development it reached in the foetus It should therefore be regarded as the distal portion of the original caecum.

In man the vermiform appendix springs from the postero-medical aspect of the caecum at a diatance of about ¾ inch below ileocaecal junction which marks the commencement of the large gut. A narrow tubular structure with a lumen about ¼ inch wide, it is attached to the caecum with a broad base, the opening into which is guarded by a crescentic fold of the mucous membrane. This goes by the name of valve of Gerlach (Joseph von Gerlach, German anatomist, 1820-96), described by him in 1847, though the same thing was noticed and described by Merlin of Heidelburg earlier in 1836 It is usually seen that credit does not go to the man who first discovers a thing but to the man who makes it known to the world As a valve it is inefficient In the early embryonic life the appendix has the same calibre as the caecum and is in line with it, it stagnates while the caecum develops At the end of foetal life, it is conical in shape and gradually tapers off to a free tip. This infantile type of appendix may persist into adult life. Its average length is 3½ inches, but this can vary from ½ to 9 inches Grauer of New York found an appendix 12 and ⅞ inches long in 1890. It is relatively longer in the child. In the aged there is considerable atrophy and it is usually a thin attenuated organ.

Completely invested by the peritoneum, the appendix has a mesentery a triangular fold derived from the left or lower fold of the mesentery of the ileum. It carries the appendicular artery along its free border. The mesentery is often short and does not reach right to the tip and causes a bend of the appendix. It is attached to the posterior abdominal wall near the pelvic brim Rarely the mesentery is absent, then the appendix is entirely retro-peritoneal. The peritoneal folds and fossae here are variable; the most important is the inferior ileo-caecal fossa. In such fossae the appendix or a loop of small intestine may become incarcerated or strangled. Uptil 1800, the caecum was thought to be devoid of peritoneal posteriorly in the majority of cases and the appendix was regarded as a retro-peritoneal structure. Extra-peritoneal approach to the appendicular abscess was therefore advised and practised.

The appendix is normally found in the right iliac fossa. Although its base is constant in position in relation to the caecum, the process itself possesses a wide range of movement when it has a mesentery. And if there is an abnormally mobile caecum, it can carry the appendix to almost any corner of the abdomen. Sir Fredrick Treves (English surgeon, 1853-1923) described these positions by comparing them with the face of a clock. In 11 and 12 o'clock positions, the appendix is directed upwards by the outer side of the colon (paracolic) or directly behind the caecum (retrocolic); this position is seen in nearly 50 percent of cases ; in the 2 o'clock position the appendix is directed towards the spleen, either in front or behind the ileum; in 3 o'clock, it is directed transversely towards the promontory of the sacrum; the 4 o'clock position or pelvic position, is when it hangs over the pelvic brim into the true pelvis; and 6 o'clock position, when it passes down towards the middle of the right inguinal ligament.

There may be anomalies in the development. The appendix may be duplicated, it may be entirely behind the peritoneum. Other results of maldevelopment are agenesis or absence of the appendix; it may be left sided (due to non-rotation of the gut), or subhepatic in position (due to non-descent of caecum). Congenital diverticulum of the appendix was reported by Hedinger in a stillborn infant in 1904. The writer reported a case of double appendix in 1936.

A knowledge of the location of the appendix is of practical value in determining a tendency to obstruction and in the spread of infection should a perforation occur.

The muscles of the appendix, like those of the intestines in general, consist of inner circular and outer logitudinal layers, but they are not complete, for opposite the root of the mesentery there are gaps—hiatus muscularis—through which the submucous and the subperitoneal tissues become continuous. These gaps transmit the nerves and vessels of the appendix. Incidentally they permit the rapid extension of inflammation from submucous to the subperitoneal tissue. The mucosa and the submucosa together make up about ⅔rds of the thickness of the wall of the appendix. The mucous membrane contains many columnar celled glands which produce mucus. Under the mucous membrane the submucous layer contains enormous lymphoid tissue, first described by Lieberkuehn in 1739 (Johann Nathaniel Lieberkuehn, German anatomist, 1711-56). These lymphoid follicles are relatively sparse during the first 2 years of life; thereafter they increase up to about the age of 20, when they normally begin to atrophy. Appendicitis is commoner during the period when the follicles are numerous and largest. They seem to behave like the tonsil of the throat in catching up and harbouring infection, which led the surgeons to regard the appendix as the "abdominal tonsil".

The appendicular artery, a branch of the posterior ileo-caecal artery (which in its turn is a branch of the superior mesenteric artery) supplies the vermiform appendix. It is an end artery. It lies along the free border of the meso-appendix and does not reach to the tip which is thus insufficiently supplied and therefore, according to some, an easy prey to diseases. William Boyd, the pathologist, says that perforation usually occurs at the tip (the writer's experience does not support this). Kelly has demonstrated that the artery supplies the tip also lying beneath the peritoneum. Sometimes there is more than one artery—one or two supplying the base and another supplying the rest of the organ. Appendicular veins open into the ileo-colic veins, then through the superior mesenteric and portal veins they drain into the liver. This explains the appearance of pyaemic abscesses in the liver from an infected appendix. The veins run with the artery.

The knowledge of the lymphatics of the appendix began to appear after 1880. The lymphatics draining the appendix pass up through the ileo-colic group of lymph nodes in the ileo-caecal angle, along the superior mesenteric vessels to the anterior mesenteric glands on the third part of the duodenum and from there to the receptaculum chyli (Jamieson and Dobson). Charpy and Poirier (Paul Julien Poirier, French physician, 1853-1907) describe lymph connection between inferior gastric glands, the subpyloric glands in the angle between the 1st and 2nd parts of the duodenum, and superior mesenteric glands. L. R. Braithwaite of Leeds, in 1923, showed by injection experiments, that most of the lymph from the ileo-caecal region undoubtedly pass deeply to join receptaculum chyli, but in many subjects, some are seen to pass upwards over the head of the pancreas to enter the subpyloric glands; some lymph pass with the superior mesenteric vessels through this group (i.e. subpyloric group) on to the duodenal wall itself, up to and occasionally beyond, the pylorus. In 1924, Dan Berceanu also demonstrated lymphatic connection, by way of pancreas, between appendix and the first part of the duodenum. Wilkie (Sir David Percival Dalbreck Wilkie, Scot surgeon, 1882-1938) suggested that adhesion or proximity of the great omentum to a diseased appendix is the alternate route for the transport of infection from the appendix to the duodenum and the stomach. The great omentum was looked upon as the great "drain pipe" by Moynihan (Lord Moynihan of Leeds, 1866-1936). On the other hand, it is known that the omentum has properties which tend to limit the spread of infection. It wraps itself round the inflamed parts and walls off the foci of infection. This property led Morison (James Rutherford Morison, Newcastle-on-Tyne, 1853-1939) to describe the omentum as the "policeman of the abdomen".

It was long thought that the lymphatics passing up the fallopian tube (Gabriele Fallapio, Italian anatomist, 1523-1562) and ovary with the ovarian vein communicated with the lymph vessels of the meso-appendix and infection from the tube and ovary reached the appendix by this route. But no such communication exists. Infection to the appendix can only spread from the tube and ovary in the presence of adhesion between them.

Nerve supply of the appendix closely resembles that of the adjacent intestine. Efferent sympathetic fibres to the appendix (and also to caecum, ascending and transverse colon) come from the superior mesenteric plexus. Efferent parasympathetic innervation to the appendix (as also to stomach, small intestines, caecum, ascending and transverse colon) is by way of the vagus, whose fibres follow blood vessels. Nerves of the digestive tract contain many afferent visceral fibres. The sensory endings occur as plexuses in mucosal epithelium and within muscle layers. Their fibres pass centrally with the vagus and with the sympathetic rami to the dorsal roots. There are two plexuses in the wall of the appendix. The Auerbach (Leopoid Auerbach, German anatomist, 1828-97) plexus is between the muscle layers and the Meissner (Georg Meissner, German histologist, 1829-1905) plexus is in the mucosal layer. Both reported their plexuses in 1862. A periglandular nerve plexus surrounds the tubular glands of the mucous membrane (Pierre Masson) and in the plexus may occasionally be found cells which can be impregnated with silver salts—these are argentaffin cells, which when they undergo neoplastic changes, give rise to argentaffin or carcinoid tumours of the appendix. Argentaffin cells are also found in the human duodenal mucosa, they secrete serotonin.

Physiology began as a teleological science.

In the Babylonian medicine (*Code of Hammurabi*, 2,000 B.C.) there is a fore-shadowing of the "humoral" physiology. Physiology and pathology of the early days were confined to the "humors", the balance of which meant health and their disturbance spelled disease. *Rigveda* (? 5,000 B.C.) and later *Ayurveda* held that all activities of the body in health and disease, were governed by three humors (*tridosha*)—*vayu*, *pitta*, and *kauph* (literally translated as air, bile and phlegm). Empedocles of Agrigentum in Sicily (504-443 B.C.) preached a doctrine of 4 elements, earth, air, fire, and water as the "fourfold root of all things". Erasistratus of Chios (Greek physician and anatomist at Alexandria, 300-225 B.C.) added *pneuma*—the natural spirit—to the humoral physiology of old.

Present physiology can be said to have its beginning with Galen, who was, amongst other things, an experimental physiologist.

From the standpoint of comparative anatomy the appendix vermiformis is an undeveloped caecum.

Huntington (George Sumner Huntington, American physician, 1850-1916) pointed out in 1903 in his *Anatomy of the Human Peritoneum and Abdominal Cavity* that all varieties of caecal apparatus met with in different species can be traced to one common primitive type from which they have developed in accordance with the varying conditions of functional demand.

Almost all mammalia are provided with a caecum which varies both in size and form. The vermiform appendix (as such) occurs only in man and the anthropoid apes, although some of the mammals may have a similar organ or just a lymphoid structure at the apex of the caecum. The caecum and the appendix together form the caecal apparatus. The appendix is absent in horse, cat, pig, ox, sheep, goat, elephant, camel and dog.

The caecal apparatus increases the extent of the intestinal surface for secretion and absorption and prolongs the retention of the partially digested substances here, for further digestion and absorption.

Among the herbivora (e.g., rabbit), whose food contains a large amount of cellulose, a comparatively small amount of nutriment in proportion to bulk and requires longer time to digest it, there is a complicated highly developed large caecal apparatus. Here vigorous fermentation takes place; contents are kneaded, churned, turned over and dried by absorption of water before being propelled to the descending colon and rectum. It acts as a second stomach.

In the carnivorous animals, whose food is concentrated and contains little non-nutritive material and is easily and rapidly digested, the caecal apparatus is a reduced or a rudimentary organ.

Among animals that live on a mixed diet, such as man, a part of the caecum undergoes more or less marked retrogressive change so that this part remains as a thin worm like process, the vermiform appendix, attached to an otherwise, well developed caecal pouch (Grohe).

The caecum of the adult man receives daily from the terminal ileum 300-500 ml. of chyme, which contains, undigested and unabsorbed residue of food. Man's usual diet contains some material (walls of plant cell) which is not easily digested higher up in the tract. This accumulates here and is to some extent digested by the bacterial action in the caecum (Davenport in the *Physiology of Digestion*).

The vermiform appendix of man is filled from the caecum. With an opaque meal, the appendix under the radiological screen, is seen to go through worm like writhing movements. At other times the shadow is divided into 5 or more beads. Then the appendix empties itself, presumably by peristalsis, only to be filled again a few moments later (Davenport).

Among animals having a caecal appendix, only in man, rabbit and chimpanzee does the appendix secrete a sufficient volume of fluid, 1 to 2 ml., daily, spontaneously. This was experimentally shown by Wangensteen in 1939 (Owen Harding Wangensteen, American surgeon, born 1898). The question then naturally arises as to the function of this secretion.

Claude Bernard (French physiologist, 1813-78) said, "Observation is passive and experimentation is active science". So far experimental evidence in support of the function of the appendix is lacking. Meanwhile conjectures will have to satisfy. As in the upper part of the intestinal tract, secretions from the liver, pancreas and intestines are poured in to help digestion, so it is only natural to presume that in the lower part after sudden transition from ileum to colon, the remnants of food are likely to be modified by the secretion of the appendix. Liberkuehn in 1739 and Vosse in 1749, both thought that the secretion of the appendix had a softening and lubricating effect on the drying food remnants in the caecum. About 1887, H. C. Chapman wrote, "(appendix) useless organ in the human being, it ought to be removed without the child undergoing any risk whatever". Smith of America thought in 1888, that the secretion of the appendix played some part in the digestion of vegetable matter. In 1898, Morris (Robert Tuttle Morris, American surgeon, 1857-1945) stated that the appendix was never a useful organ and that it is a threat to life when infected. The wit-cracker says that the appendix is there to enable the surgeon to earn a living.

In birds the lymphoid organ, the bursa of Fabricius (Hieronymus Fabricius ab Aquapendente, Italian anatomist and embryologist, 1533 ? 1537-1619) is situated near the cloaca. Mammals have an equivalent tissue, perhaps more widely distributed e.g., lymphoid tissue of the thymus (first lymphoid tissue developed in mammals; it atrophies in adults), tonsils, spleen, Peyer's patches of the ileum (Johann Conrad Peyer, Swiss anatomist 1653-1712), vermiform appendix and colon.

The lymphoid tissue of the intestine is thought to act as the central organ responsible for the development of peripheral lymphoid tissues destined to produce all classes of immunoglobulins through the plasma cells.

The removal of the bursa of Fabricius results in immunologically deficient state in birds; the same happens when rabbits are deprived of their intestinal lymphoid tissue. It therefore seems not unreasonable to assume that the human appendix, which is particularly rich in lymphoid tissue, is involved in the defence of intestinal tissues from "tumoral and infectious noxae".

Charles Nicolle (Charles Jules Henri Nicolle, Tunis physician, 1866-1936) and E. Conseil of France, in 1922, showed that immunity against bacillary dysentery and Malta fever is partially carried in the lymphoid tissue of the appendix. In 1923, K. H. Digby stated that the appendix had an immunising function against bacterial poisons in the caecum.

An important evidence in favour of function is that instead of atrophying before birth, the appendix goes to full development, persists throughout adult life and atrophic changes in it are seen only with the atrophic changes of the body at large. Against these facts however there are numerous cases when surgeons have removed healthy appendices without any deleterious effect. So far the appendix in man is a mysterious structure with no known function. Perhaps time and endeavour will clear up as they have done many unknowns in the past.

Pathogenesis is the mode of production and development of any disease or morbid process. Primitive people ascribed disease to something projected into the body of the victim, something taken from it, or to the effect of sorcery upon some part or some object connected with the body of the victim. Hippocrates (c. 460-377 B.C.) first threw off the demonology of priests and looked upon disease as part of the order of Nature which could be predicted and altered. He held that the body is composed of 4 fluids or humors—blood, phlegm, yellow and black bile—which gave rise to 4 temperaments. Their imbalance was responsible for disease.

Pathology of olden days revolved round humors.

Observers from Celsus to Morgagni based their work on naked eye appearance of diseased individuals and organs. Morgagni (Giovanni Battista Morgagni, Italian anatomist and pathologist, 1682-1771) was the founder-father of pathologic anatomy; he first correlated post-mortem findings with clinical records. First compound microscope was made by Janssen, a Dutch spectacle maker in 1590. Antonj van Leeuwenhoek (1632-1723) a draper of Delft improved on this. His microscope gave a magnification of 160 diameters. The first microscopist and histologist was Marcello Malpighi of Bologna (1628-1694). As the technique of microscopy improved, Virchow (Rudolph Virchow, German pathologist, 1821-1902) was able to investigate changes at the cellular level.

In spite of the fact that intimate secrets of cellular physiology, as are now being revealed by bewildering number of specialised techniques, micro-dissection, electron microscopy, etc., it is still as true as ever that the most important investigation into the nature of disease is based on a careful investigation of the patient himself.

The vermiform appendix is subject to all the various diseases to which its component anatomical elements are liable in other parts of the body.

Diseases of the appendix loom large in surgical practice. Appendicitis is the most common abdominal condition which a surgeon is called upon to treat. It is at one and the same time one of the best recognised clinical entities and one of the most difficult problems that confront the clinician.

Appendicitis is a disease of man. Primitive types of men (like Bantus of Africa) are said to be less susceptible to it. The disease appears not to occur in animals in the wild state, but the information is scanty. It is fairly common amongst apes in captivity (London Zoo Report).

Though the recognition of the appendix as an anatomical structure dates back to early Egyptian times or even earlier, clear observations on the pathological changes in the appendix seldom appear before 1800.

John Arderne, English surgeon, (? 1306-90) wrote on *passio iliaca* (? appendicitis or intestinal obstruction).

Lorenz Heister, German surgeon, (1683-1758) did the first post-mortem examination of a case of appendicitis in 1711. The pathological appearance was clearly described by him.

Friedrich Hoffman of Halle (1660-1742) wrote on appendicitis in 1716.

Jean Baptiste Louyer-Villermay published in 1824 (*Arch. Gen. Da Med.*, Vol. V.) several detailed case records of acute

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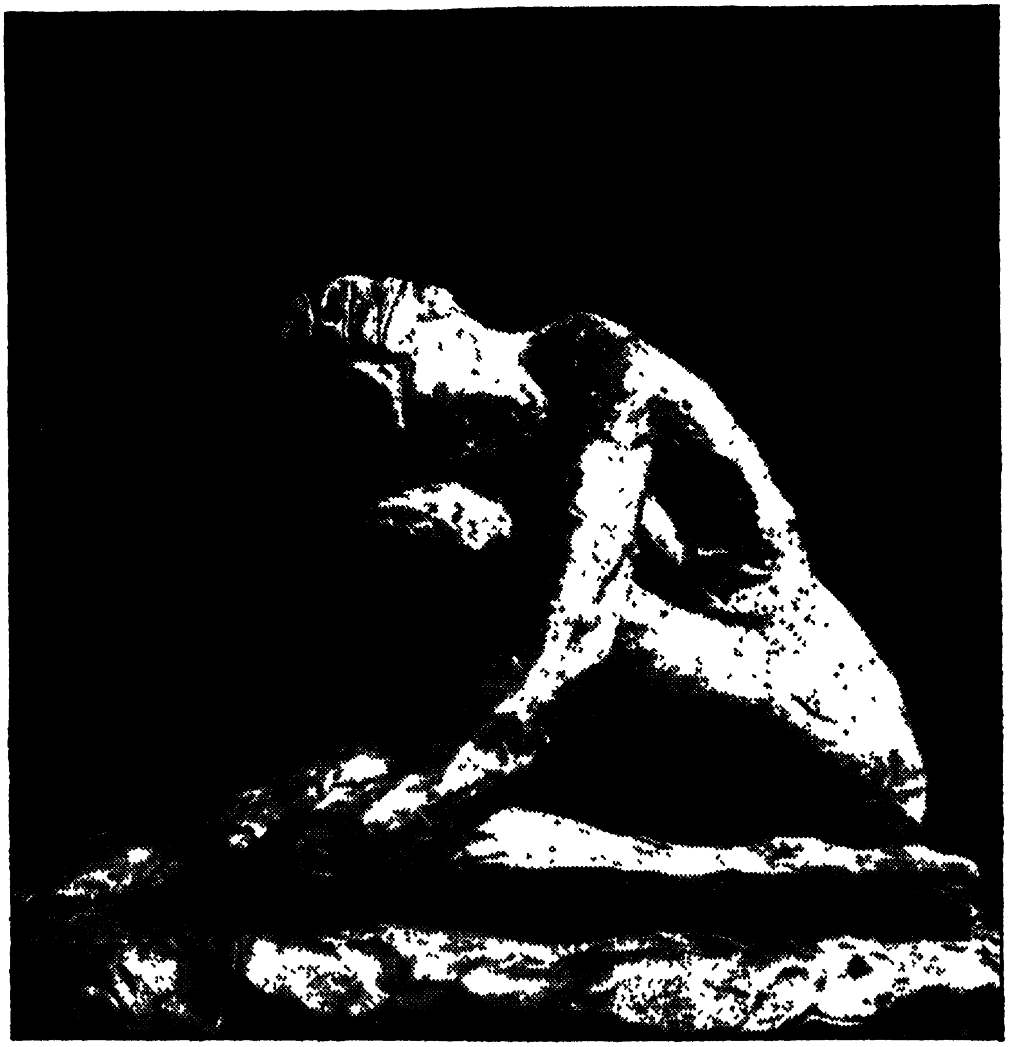

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appendicitis in Paris and commented on the symptoms in relation to pathology.

Francois Melier (French) envisaged the possible benefit of surgical treatment in these cases in 1827.

About 1830, German Gottfried Goldbeck and his school advanced the belief that primary disease of the ileocaecal region lay in the caecum and not in the appendix. They introduced the terms, "typhlitis", "perityphlitis", "endotyphlitis", which stuck for a long time and retarded the clinical conception of appendicitis.

Though Bright (Richard Bright, 1789-1858) and Addison (1793-1860) both physicians in Guy's hospital, London, in their *Elements of Practice of Medicine* accurately described in 1839, the clinical signs and the usual course of appendicitis, a pre-occupation with typhlitis and perityphlitis prevented acceptance of the disease by the majority of surgeons for about 50 years. In this regard Dupuytren (Guillaume Dupuytren, great French surgeon, 1775-1835) is blamed largely for his insistence even in 1833, that right sided abdominal inflammations are due to primary disease of the caecum—*tumeurs phlegmoneues*—rather than disease of the appendix. Dupuytren has been described as the first of surgeons and least of men for his overbearing, mean and unscrupulous temperament.

Georges Dieulafoy, Toulouse physician (1839-1911) detailed complications of appendicitis about 1880. For his handsome appearance he was known as *la beau Dieulafoy*.

Reginald Heber Fitz, Boston pathologist (1843-1913) published in 1886, a monograph describing 100 cases of successful drainage of abscesses of the appendix (found in literature from 1848 to 86). In this work he stated for the first time in a clear and decisive manner "It is the duty of every physician to be mindful that, for all practical purposes, perityphlitic tumour, perityphlitic abscess mean inflamation of the vermiform appendix" (*New York Medical Journal*). He coined the word "appendicitis".

Appendicitis is either acute or chronic. Simple acute appendicitis may be catarrhal, intramural, follicular or obstructive. Acute appendicitis has been found in still born infant; Meigher and Lucas reported acute appendicitis in newborn infant in 1952. But it is rare before 2 years of age.

Simple acute appendicitis is sudden in onset and is no respecter of time sex or age, though there may be a predilection for the younger age group (before 40). It starts with pain. The pain, explained by the innervation, starts about the umbilicus or over the whole of the abdomen or over the epigastrium. The colicky pain is due to increased intra-appendicular tension or to appendicular contraction. The pain localises in the right iliac fossa in about 12 to 24 hours, giving rise to localised tenderness and muscle guard. The guard may be mistaken for a lump. There is vomiting, nausea or merely distaste for food and is followed by a rise of temperature. The temperature is round about 102 degrees Fahrenheit (Gabriel Daniel Fahrenheit, German physicist, 1686-1736). A higher temperature usually means a complication like peritonitis.

The sequence of pain, vomiting and temperature has been stressed. Murphy (John Benjamin Murphy, Chicago surgeon, 1857-1916) used to say, "when this order varies, I always question the diagnosis". It is a good working hypothesis though not always literally correct.

Predisposing causes for an acute attack may be local or general. Among the most important causes are the normal anatomic and physiologic conditions of the appendix. The appendix is a blind tube of relatively great length with a small caliber and a narrow outlet. It resembles the tonsil in its abundance of lymphoid tissue and like it, the appendix borders on a cavity, the caecum, rich in bacteria.

Many conditions have been cited as exciting causes, as for example—food habits (meat), disorders of digestion and even of menstruation, trauma, foreign bodies, concretions, faecoliths, ascaris, oxyuris, amoeba and other parasites like bilharzia. There is however no conclusive evidence; the final cause is always infection. The normal appendix contains in its canal infective agents, which innocuous in the normal bowel, only await the appearance of circumstances favourable to the exercise of their nefarious activities. A specific bacterial action is unusual. In most cases the infection is a mixed one of *B. coli and Streptococcus faecalis* and other intestinal commensals (organisms living together for mutual benefit in partnership not parasitism); less commonly Streptococcus is present alone. Faecolith, first described by the Italian anatomist Giovanni Domenico Santorini (1681-1737) is comprised of inspissated faeces. It does not excite infection. It is usually a product of previous inflammation but it can favour subsequent attacks. An appendicular calculus is formed by the deposition of inorganic salts chiefly calcium on a faecolith. It is usually associated with infection of the appendix and excessive mucus formation. Mucus contains calcium and phosphatic components. It is radio-opaque and may show faint lamination thus confusing with ureteral and gallstones. It is a rare finding. German Wegeler reported the first case, found during the post-mortem examination of a boy of 18 in 1813. Singh *et al.* reported 3 cases of appendicular stone from the Wellingdon Hospital, New Delhi in 1971 (*Indian J. Surg.*).

The infecting organisms can gain access to the appendix through the intestinal tract, lymph or blood streams. There they multiply and produce toxins. This disease began to attract attention in our country after 1902, when Treves operated on King Edward VII of England and drained an appendicular abscess, two days before his coronation. Ironically enough Treves lost his own daughter from perforative appendicitis—no laparotomy being done.

Infection in our country is practically always haematogenous. In Bengal fulminating cases of appendicitis are uncommon, there is usually a lump formation. The formation of a lump is helped by the infection starting in the outer wall as also by the soddenness of the caecal wall, the result of previous chronic infective conditions, like dysentery, etc., so common in our country. This helps to attract the omentum or the nearlying loops of small intestines to the site for the formation of the lump. Serial sections made of unselected consecutive 150 appendices removed at operation showed involvement mostly of the outer coats to the exclusion of the inner (writer, 1944). This has been the experience of Sir Cecil Wakeley the English surgeon (*Brit. Med. J.*, 1950)

The discovery of a lump in the right iliac fossa or a muscle guard over it, associated with an acute onset is diagnosis positive.

There are a number of signs which help the diagnosis :

1. Tenderness over the McBurney's point (Charles McBurney, New York surgeon, 1845-1913, described his point in 1889). McBurney's original description is "a point ½ to 2 inches above the anterior superior iliac spine on a straight line joining that process to the umbilicus". This is usually identified now-a-days as the junction of the middle and lateral thirds of that line.

2. Tenderness at any point in Sherren's triangle which is bounded by lines joining umbilicus, right anterior iliac spine and symphysis pubis. James Sherren (English surgeon, 1872-1945) described it in 1903.

3. Rebound tenderness—sudden lifting of the palpating hand from the right iliac fossa is as painful as the depression into it.

4. Rovsing sign (Thorkild Rovsing, Copenhagen surgeon, 1862-1927 described the sign in 1907)—Pressure on the left iliac fossa forces gas from the pelvic colon to caecum Distension of the caecum disturbs the inflamed appendix and gives rise to crossed pain on the right side.

5. Bastedo's sign (W. A. Bastedo, New York physician, born 1873) is the same as Rovsing sign except that it is produced by inflating the colon with air per rectum.

6. Aaron's sign (Charles D. Aaron, American physician, born 1866) is referred pain or distress in the epigastrium by continuous pressure over McBurney's point.

7. Reder's sign is tenderness in the lower portion of the right iliac fossa when palpated per rectum.

8. Psoas sign—Patient lying on the left side, if the right thigh is hyperextended there is right lower quadrant pain by putting the psoas under the inflamed appendix in tension. This is also known as "kick sign".

9. Obturator sign—Obturator internus is put under tension by inverting, abducting and slightly flexing the right thigh at the hip. The inflamed appendix lying on the fascia gives rise to pain.

10. Ott's sign (Isaac Ott, American physician, 1847-1916)—lying on the left side, discomfort increases in the right iliac fossa.

Localisation of the pain in the right iliac fossa and muscle guard over it are obtained only when the appendix is in its usual normal place. The site of pain and tenderness varies with the position of the appendix. The appendix lying under cover of the caecum gives rise to pain in the lumbar region, and there is no muscle guard over the right iliac fossa. The absence of muscle guard over the iliac fossa is also observed in cases of pelvic appendix when it gives rise to pain during micturition (usually at the end) and/or tenesmus; there may be diarrhoea. The pain may be referred to the right testis and the misleading sign of blood and pus in urine may be present, if the appendix lies on the ureter. In the case of the undescended appendix, the pain and muscle guard (and swelling when present) are in the right hypochondrium. In case of non-rotated appendix, the pain and guard will be over the site of the arrested appendix—in the middle line or left side of abdomen.

Appendicitis which goes on to suppuration begins as a catarrhal appendicitis with lump formation. The onset of suppuration cannot be predicted. The probability of abscess formation increases in proportion as the fever persists and the lump goes on increasing in size. With suppuration the initial constipation may be replaced by diarrhoea. There is often leucocytosis and fluctuation may be elicited over the mass. In a neglected case of this condition, the skin over the lump becomes reddened and oedematous. Untreated, the pus may make its way to the surface, an uncommon occurrence. It is more likely to rupture into the general peritoneal cavity, bowel, vagina or bladder, or it may track upwards to the sub phrenic region. Pus from a retrocaecal appendicular abscess may open in the lumbar region and leave a sinus. The abscess may, in some cases, remain latent.

The leading symptom of acute appendicular obstruction (often by a faecolith) is colic; the pain comes and goes. The colic is often severe and the patient may vomit once or twice without relief. There is no rise of temperature in the beginning and the pulse is not necessarily accelerated. Rebound tenderness and Rovsing sign are present. These cases are dangerous, for they often perforate without notice. With perforation the violent pain disappears and the patient may even feel better, for a time at least, but the pulse soon begins to rise and the picture of peritonitis supervenes.

Gangrenous appendicitis may begin as catarrhal appendicitis. It is the result of ischaemia and anaerobic infection combined. There may be patches of gangrene on the wall, or the whole appendix may be turned into a greenish black, rotten, foul-smelling bag. The onset of this complication is quite sudden because of the venous thrombosis of the appendix mesentery. There is a sudden amelioration of the pain with the onset of gangrene, but all symptoms of toxaemia increase as also the risk to life.

Peritonitis in acute appendicitis may come on suddenly. Peritonitis results either by direct spread from an acutely inflamed appendix or from a perforated or gangrenous appendix or from rupture of a localised appendicular abscess. Acute appendicitis may begin as peritonitis.

When fully developed, peritonitis of appendicular origin does not differ in its features from diffuse peritonitis of other origin. Symptoms of general toxaemia are present—the expression is anxious, the colour muddy with sunken eyes and dry furred tongue. Vomiting is often persistent. The pulse is rapid and the temperature is raised. The temperature may be sub-normal—a serious portent. The respiration is thoracic. The abdomen is distended and tender with board like rigidity. The patient lies on his back with legs drawn up. Auscultation reveals no intestinal movements; heart sounds are audible over the distended abdomen and there may be peritoneal friction sounds. Pritoneal fluid may be present. There may be a little more guard over the right iliac fossa than over the rest of the abdomen. In the last stages, effortless-coffee ground vomits and hiccough are troublesome.

Other complications of appendicitis are ileus, jaundice due to catarrhal cholangitis or to portal pyaemia (in the latter condition pyaemic abscesses form within the liver and the general condition of the patient rapidly deteriorates), thrombosis of the portal vein and/or of the external iliac vein, subphrenic abscess, empyema and abscess of the lung. Salpingitis or other pelvic inflammations may occur in women.

In a straight forward case of appendicitis no difficulty should arise as to the diagnosis. When difficulties arise, the case has to be differentiated from the following :

1. Pelvic causes—salpingitis, pyosalpinx, ruptured tubal pregnancy and inflammation or torsion of an ovarian cyst are to be eliminated by history and by bimanual examination of the pelvis. Ruptured leutin cyst (apoplectic ovary) is another cause as is torsion of the omentum.

2. Hepatic causes—cholecystitis or cholelithiasis can generally be differentiated by the position of the tenderness and the radiation of the pain to the shoulder or to under the right scapula. Disease of a sub-hepatic appendix may simulate affection of the gall bladder very closely. An enlarged low lying gall bladder on the other hand, has been mistaken for an appendicular abscess.

3. Gastric causes—gastric and duodenal ulcers should be excluded by enquiry into the food-pain relation, epigastric tenderness, melaena and haematemesis.

4. Renal causes—movable kidney with Dietl's crisis (Joseph Dietl, Cracow pathologist, 1804-78), renal and ureteral calculus may simulate acute appendicitis. It has already been pointed out that pus or blood in urine does not exclude acute appendicitis. It may be impossible to differentiate right sided pyelitis.

5. Hyperplastic tuberculous involvement of the ileocaecal junction and traumatic pyogenic iliac abscess of the right side mimic appendicular lump. The first has a slow insidious onset with evening rise of temperature and gradual

deterioration of health. The lump is hard and irregular to the feel and there may waxing and waning of its size. In the second, there is a history of trauma, followed by fever and limping; then a lump develops in the right iliac fossa. The patient now takes to bed with a hectic temperature and the right hip is kept flexed. Symptoms suggesting intra-abdominal mischief are absent. Palpation may not help differentiation from an appendicular lump. Here, unlike in the case of an appendicular lump, no gap is felt between the anterior superior iliac spine and the lump. Rectal palpation is a great help. The appendix lump can be moved (even slightly) by the rectal finger but not the iliac lump, for it is under the iliac fascia. There is oedema of the lateral pelvic wall in iliac abscess. The acute flexion of the hip is significant.

6. Medical causes—that are likely to cause confusion are lead colic, eruptive fevers, filarial infection, right sided funiculitis, round worms and even malaria.

7. Extra-abdominal causes like basal pneumonia, diaphragmatic pleurisy, coronary pain, spinal caries that mimic appendicitis should be eliminated by careful examination. Auscultation of the chest, examination of the spine and rectal palpation are notoriously neglected in cases of suspected abdominal mischief. This neglect may prove expensive.

Aretaeus of Cappadocia is reputed to have described in 30 A.D., an abscess of the appendix which was drained and the patient recovered.

Claudius Amyand, born French, naturalised English (born between 1681 and 1686, died in 1740), was Sargeant Surgeon to the English King George II. In 1736, he removed an appendix with a pin it contained, and the surrounding omentum from a scrotal hernia complicated by a faecal fistula in a boy of 12. "He explored the scrotal swelling and found the appendix perforated by an encrusted pin...the appendix was doubled up. It was amputated and a stump one inch long was left because a fistula was anticipated. The hernial sac was removed and the fistulous tract was excised. Healing was rapid, the stump ligature separated on the 10th day without incident. The operation lasted for half an hour". It should be remembered that this was before the days of anaesthesia. Tribute should be paid to the skill of the surgeon and more to the fortitude of a small boy. This is the recorded first case of appendectomy. Mestivier, the French surgeon, is commonly credited with having done the first appendectomy in 1759. Mestivier only drained an appendicular abscess and on post-mortem examination the appendix was found to have been perforated by a pin.

In 1848, Henry Hancock of London was the first to operate on a patient with acute appendicitis, before abscess formation; a faecolith was obstructing the lumen.

In 1880, Tait (Robert Lawson Tait, gynaecologist of Birmingham, 1845-99) operated on a girl of 17, with a diagnosis of "general peritonitis from rupture of caecum or vermiform appendix". He found a gangrenous appendix in an abscess cavity, removed it and inverted the stump. The girl lived. This was published 10 years later in 1890.

In 1887, Morton (Thomas George Morton, American, 1835-1903) was the first American to operate deliberately and successfully for appendicitis in a quiescent period.

Onset of appendicitis should be firmly excluded in cases of acute abdominal pain, before the common household remedy of a dose of purgative is administered. Purgative in appendicitis may lead to perforration, as Moynihan wrote in his nursery rhyme—

Purgation means perforation
With appendix kinked and bad
Both food and drug will worry him
And aperients drive him mad.

Surgeons are usually confronted with cases of appendicitis within 24 hours or less of onset; they may come later than this. They also come with a lump or with an abscess or as a fulminating case with perforation or gangrene and/or general peritonitis. The treatment is surgery.

Surgical treatment of acute appendicitis can profitably be divided into "immediate" and "wait and see". If seen within 48 hours, immediate surgery serves the interest of the patient best. Here complications have not appeared, the removal of the appendix is not beset with problems and the patient is saved a difficult or complicated convalescence. Fitz had advised operation in such cases in 1886. If the case is seen later, the decision to operate will depend on whether the acuteness is settling down or not. Obstinate, routine, ruthless immediate appendectomy in all cases, irrespective of the local and general condition is injudicious and undefendable. In such cases Ochsner-Sherren's (Albert John Ochsner, American surgeon, 1858-1925 : James Sherren, English surgeon) advice of "wait and see", introduced in 1904/5, gives rewarding results by halting the progress. The patient is put up in Fowler (George Ryerson Fowler, New York surgeon, 1848-1906) position, gastric suction is started, parenteral saline and antibiotics are administered, food is withheld. Purgatives interdicted, but a small saline enema may be allowed depending on circumstances. A careful watch is maintained "on the threshold of the operation theatre" so that an operation can be undertaken without delay, should necessity arise any time. That prognosis of appendicitis with peritonitis is bad, led Murphy to advice prophylactic removal of appendix in childhood to prevent future appendicitis. Presence of a lump shows that nature's protective mechanism has come into play and the case is going towards stabilisation. Here operation should be postponed, for wading through the lump to get at the appendix will break down nature's limiting barrier and dissiminate infection. Besides the conservative treatment, exhibition of emetine hydrochloride helps resolution of the lump in our country (amoeba participation). Appendectomy should be undertaken later during the quiescent stage. Once an appendicitis it will always recur, unless it is that rare condition when the first infection has killed the appendix by transforming it into a fibrous cord with obliterated lumen. "Recurrent appendicitis" repeats itself 3, 4 times a year. A "relapsing appendicitis" is when it relapses before complete symtomatic resolution has taken place.

Some cases of undisputed abscess get absorbed under expectant treatment. If however, this happy ending is not achieved, and the abscess goes on increasing, it should be drained; the offending appendix, if easily isolated, should be removed at the same sitting. But if there is danger of disturbing the general peritoneal cavity by the manipulations, the removal of the appendix better be deferred to a later date. It is wiser to lose a few weeks than lose life.

Before 1880, laparotomy had been practised with success; but to suggest that the inflamed peritoneal cavity should be traversed by the surgeon remained a heresy up to nearly 1890. A retroperitoneal approach was suggested under the belief that the appendix was retroperitoneal behind the caecum.

In the fulminating groups, immediate surgery to remove the appendix is the rule; and this should also be the rule in acute obstructive cases to avoid the danger of perforation or gangrene. In the fulminating cases, only by the removal of the appendix, the dangerous and continued source of infection, can the condition be controlled. Any peritoneal fluid present is sucked up, local antibiotics are helpful. The peritoneum is drained through stab wounds (not through the line of incision) only if the abdomen is badly soiled. As in the preparatory pre-operative period, gastric suction, parenteral fluid and protein and chemotherapy should be continued in the post-operative period also. And above all Murphy's dictum (1904) of "quickly in and more quickly out" will pay rich dividend even today.

Acute appendicitis in children deserves special mention, because it often starts as diffuse peritonitis from a necrosis or perforation. Appendicitis may occur in children in the course of an infection like measles or mumps. The defensive mechanism in children is weak, and the omentum, "the policeman of the abdomen", is small and not fully developed, hence the protective localisation is less likely to materialise. Immediate operation should therefore be the rule. The diagnosis may be difficult because a clear cut accurate history is often unobtainable and physical examination is unsatisfactory in children. The disease is simulated by pneumococcal peritonitis, intussusception, intestinal colic, tuberculous mesenteric adenitis, eruptive fevers.

At the other end of life the vermiform appendix is an atrophied organ and its involvement in infection and inflammation is an uncommon occurence. When however infection does occur, the body reaction is not vigorous. The initial pain is less intense and colic may be absent. The first symptom may occur with perforation or peritonitis. Prompt surgery is necessary to salvage these patients.

In advanced pregnancy diagnosis of acute appendicitis is difficult, the pain may be confused with uterine contraction pain.

For removal of the appendix many approaches are in use—the choice varying from midline or paramedian approach in every case to local iliac incisions. The ideal incision is the one that is placed over the expected pathology; the incision should be sufficiently long and then a little longer to avoid unnecessary trauma by pulling and forcible retraction. Incision should travel through muscles rather than fascia, fascia unites tardily. Muscles in the line of incision should be split in the direction of their fibres rather than cut across (except in the case of the rectus which has a segmental innervation). Incision should divide no nerves. Incision should be easily enlargeable in case of need. Incision should be quickly and securely repairable at the end of operation. Incision should prevent superimposition of the cuts through the different layers of the abdominal wall. Drainage tubes should be inserted through separate stab wounds and not through the line of incision. "Our ideals are framed, not according to the measure of our performances, but according to the measure of our thoughts" (A. J. Balfour in *The Foundations of Belief*).

McBurney's muscle splitting gridiron incision, introduced in 1894, is good for straight forward cases, it has to be enlarged for difficult cases.

The muscle cutting iliac incision popularised by Rutherford Morison, was first introduced by Fowler in 1894. The obliquity of the incision safeguards the ilio-inguinal nerve, the injury of which produces inguinal hernia. Both these incisions give direct approach to the normally placed appendix.

Using these incisions, when the peritoneum is opened the intestines present themselves. The caecum is recognised by its anterior taenia as also by its pearly colour, the small intestine is pink coloured. The caecum is delivered into the wound and tracing the anterior taenia the appendix is reached, if it is not already visible on the delivery of the caecum.

W. H. Battle in 1895, suggested going through just medial to the right of the semilunar line. This involves opening the rectus sheath and retracting the rectus medially. The length of this incision must necessarily be limited to about 2½ inches, if the 11th and 12th segmental nerves are not to be injured. In case of abscess the rectus sheath is open to serious and protracted infection and the inferior epigastric vessels will be in danger.

Right paramedian incision is an admirable incision for all kinds of abdominal work; it is valuable if the diagnosis is in doubt. Most inflamed appendices lie close to the caecum and this incision will entail traversing the abdominal cavity to reach the appendix with the attendant risk of spreading infection.

The low midline incision is also a good incision, but has the same objections as the paramedian for appendectomy in acute cases.

It should however be remembered that these standard incisions may have to be varied to suit the position of the abnormally situated acute appendix. After isolation of the appendix, the appendicular artery is tied and cut off with the mesentery. The base of the appendix is then crushed, ligated and amputated; carbolisation of the stump is not necessary. Crushing is easy, quick and above all, safe. Crushing divides all the coats (where the infection lies) except the peritoneum and the ligature sits securely here. The only drawback of crushing is that if the appendix is stiff and tense, it might break off; but even then no soiling takes place because of the sealing off of the base by the crush. The stump is then buried by a Z stitch which is efficient and is more easily applied than the age old purse string suture. Burying of the stump after crushing is not necessary but gives double security, and is a refinement.

Difficulties during isolation of the appendix may be overcome by retrograde dissection or even by submucous resection of the organ as was first done by Kelly in 1905. By 1904, logical and fairly successful methods of surgical treatment of acute appendix was established.

Sometimes complications follow appendectomy in the acute stage. Wound abscess (to prevent this the cut margins of the parieties should be protected; absorbable sutures should be preferred to non-absorbable when infection is feared), residual abscess, pelvic abscess and ileus, subphrenic abscess, pyelophlebitis and liver abscess, melaena (2 personal cases); acute intestinal obstruction, faecal fistula, complete wound dehiscene, progressive anaerobic infection of the abdominal wall (a lethal condition).

Ian Aird (London surgeon, 1905-62) writes "The first tumour of the appendix, its nature still unknown, was described by von Pommer Esche (? in 1837) and the first undoubted primary carcinoma by Beger (? in 1882)" Tumours of the appendix are not common. The commonest is carcinoid which was first described by Oberndorfer in 1907. Carcinoid is commoner in women than in men. It is found about the tip of the appendix and is only locally invasive, unlike its counterpart in the ileum which metastasises in the liver. It is often an accidental finding for it causes no symptoms. The tumour cells have affinity for silver stains and hence called argentaffinoma.

Adenocarcionoma of the appendix is a rare find in elderly persons; when found it behaves like carcinomas of large bowel. Sarcoma, lymphosarcoma and benign tumours like fibroma have been reported. Only on rare occasions secondary tumours may be found.

Mucocele of the appendix is produced by obliteration of the lumen of the appendix; the contents are relatively sterile.

Torsion of the appendix was described by Payne in 1918.

A case of "intussusception" was reported by McKidd in a boy of 7 in 1859. It was a case of inversion of the appendix. True appendicular intussusception was described by Chaffey in 1888.

Endometrial tissue has been found in the outer coats of the appendix (Romanus). Decidual formation may be seen in the serous coat in cases of pregnancy.

No dissertation on vermiform appendix is complete without a consideration of "chronic appendix". It is very difficult to define the condition. It is no wonder that Lord Bacon said "Show me a man who can define and I will show you a god".

While "acute appendix" has been more or less completely worked out, "chronic appendix" has no definitely established pathology. This disputed condition (clinicians are still divided into believers and non-believers) is not the acute appendix becoming chronic; neither is it the resting stage of the appendix between attacks of inflammation, acute or subacute. It is chronic from the beginning; it does not usually go to acute exacerbation but gives rise to symptoms like dyspepsia.

Ewald (Carl Anton Ewald, Berlin physician, 1845-1915) seems to have been the first to draw attention to the association of appendicitis with gastric symptoms in 1889. He called the condition "appendicitis larvata".

In 1900, Camille of Paris contributed a study on chronic appendicitis.

In 1906, P. N. Hansen advanced the belief that adhesions of the appendix to the adjacent structures and accumulation of fact in its mesentery, were evidences of chronic appendicitis. It might be recalled for comparison, that deposition of subserous fat and change of the normal blue colour of the gall bladder were stressed by Moynihan as the early chronic inflammatory manifestation of that organ.

Once the idea got currency, contributors vied with each other in detailing various conditions as manifestations of chronic appendix. In 1908, J. Walter of France wrote that chronic appendix can give rise to pseudoanginal pain.

In 1910, Lockhart Mummery (John Percy Lockhart Mummery of England, 1875-1957) thought that colitis was caused by chronic appendix. The same year, Moynihan wrote that dyspeptic symptoms were produced by chronic appendix. Also in the same year, Meyer said that chronic changes in the appendix could bring forth secondary pathological changes in the stomach.

In 1912, Moynihan further said that most peptic ulcers originated from diseased appendix. In the same year, H. J. Paterson of England declared that haematemesis and hyperchlorhydria resulting from chronic appendix ceased after appendectomy.

Pendulum has swung far and appendectomy was frequently being performed without sufficient indication or justification. This led Hugh Cabot of America, to state in 1920, that chronic appendix has become the "scape goat of abdominal surgery".

In 1922, J. A. Lichty reported an occurrence of 40 per cent failures of symptomatic cures in which the diagnosis before operation was chronic appendix. The same year Balfour (Donald Church Balfour, American surgeon, born 1882) reported cases of haematemesis that were apparently associated with chronic appendix.

In 1924, H. W. Bettman listed numerous errors leading to unwarranted operation of appendectomy. The same year Mayo (William James Mayo of America, 1881-1939) stated that chronic appendix bore a definite relationship to and often was the aetiological factor of other abdominal lesions.

In 1925, Deaver (John Blair Deaver, Philadelphia surgeon, 1855-1951) admitted the entity of chronic appendix.

American Arthur E. Hertzler in 1926 wrote "I can believe the pineal gland is the seat of the soul because there is no evidence of any kind regarding it, but that the appendix is the seat of so much mischief is incomprehensible because there is so much evidence that it is not true".

In 1927, A. Fraikin of France stated his belief that caecal spasm was commonly responsible for diagnosis of chronic appendix.

"When the abdomen has been opened up on the operation table", wrote Moynihan, "the evidence is not so much in the appendix as in the distal part of the stomach. The pyloric portion will be seen to contract and harden and become pale. It then relaxes. Except for some more congestion than normal, the distal half of the stomach shows no abnormality".

The pendulum has thus been swinging from one extreme to the other.

Said Sir John Ryle "Eyes without the microscope, ears without the stethoscope, wits without the help of chemistry and radiology...can often carry us a long way". There is however, as yet, no certain method of clinically differentiating the true from the false chronic appendix.

The symptoms of chronic appendix, that go by the generic name of appendicular dyspepsia, are vague, irregular and not clear cut. The attacks of pain are limited to the right iliac fossa, constantly recurring without vomiting or fever. The symptoms may come soon after food, sometimes earlier, sometimes later and usually in an irresponsible and capricious manner. There is no fixed interval of relief from pain as in the case of a peptic ulcer. There may be haematemesis. The pain may be in the epigastrium; pressure may give relief. It often comes on, on exertion. Clinical findings are non-convincing.

The radiological investigation has definite limitations. The non-filling of the appendix after an opaque meal or its failure to empty itself when filled, in 24 hours, is of no significance. There are however certain indirect evidences—like irritability of the pylorus leading to rapid evacuation of the stomach and ileal stasis. Tenderness on pressure over the visualised appendix is a suggestive finding. Radiological investigation can however, be usefully employed to exclude affections of the gall bladder, stomach and duodenum, which chronic appendix often mimic to the confusion of the clinician.

The involvement of the appendix has to be arrived at only after careful evaluation of the patient's symptoms and after all confusing factors and every alternative possibility have been decisively ruled out, if necessary by repeated investigations and therapeutic trials. A correct diagnosis of chronic appendix will depend not alone upon the collection and right interpretation of all possible contributing causes, but upon the judicial shrewdness with which the facts are marshalled, the relative importance assigned to each and the conclusions drawn. Such wisdom is not acquired from books, but only from longstanding observations and from bitter experience. Our wisdom comes from our experience and our experience from our failures.

To be pursuaded without proper assessment, to incriminate the appendix and rush to its removal in every case of abdominal discomfort will be a mistake and bring discredit to the profession. Chronic appendix left to itself is not likely to cause much harm, for it usually does not flare up in an acute attack, but symptoms will persist. Surgical intervention is undertaken more with hope than conviction.

In the wrong case the patient gets no relief from surgery and continues to suffer both in body and mind. These patients often walk surgeons' clinics and a gullible surgeon is induced to undertake separation of "adhesions" or removal of this or that organ in an anxious attempt to bring succour to the suffering patient. In the right case the resulting improvement will be better than expectation, even though no pathological changes are discernible and the excised appendix is indistinguishable from normal.

The only satisfactory proof of the complicity of the appendix is the therapeutic test. Patients almost always feel better, for a period of time at least, after any abdominal section. The test is continuance of symptom-free health and enduring satisfaction of the patient long after appendectomy. It is a stringent test but the only acceptable evidence of the guilt of the disputed chronic appendix. A still better test is when the erstwhile patient brings to his surgeon his friend, a sufferer from abdominal symptoms like his own.

Ideas, good or bad, die hard. Chronic appendix is not a myth. The controversy lives because of our inability to separate the wheat from the chaff and our advice, without taking a thought, for appendectomy in cases of chronic, ill-defined ills of the abdomen.

Long centuries ago, *Charaka* had set down—

ज्ञानबुद्धि प्रदीपेन यो न पश्यति तत्त्वविद् ।
आतुरस्यान्तरात्मानं न स रोगान् चिकित्सति ॥

(If the knowledgeable person cannot enter the very innermost part of the patient with the lamp of wisdom, he cannot treat the disease).

NOTES AND NEWS

States to Have Stronger Drug Control Machinery

The Union Health Ministry has proposed a scheme for strengthening drug control administration in States and to combat spurious and sub-standard drugs.

The scheme calls for the appointment of one full-time officer-in-charge of drug control, adequate number of drug inspectors and creation of an "intelligence-cum-legal wing", in each State.

According to the Union Health Ministry, full-time drug controllers are functioning at present only in five states of Maharshtra, Gujarat, Kerala, Mysore and West Bengal.

Delhi Doctors to Get More

The Union Health Ministry has issued orders for increasing the emoluments of interns, house surgeons and postgraduate scholars in Delhi hospitals.

Effective from March 1, 1973, the interns will get Rs. 225, house surgeons Rs. 325 and postgraduate scholars Rs. 350 per month. Earlier, they were getting Rs. 200, Rs. 275 and Rs. 300 respectively.

This is an *ad hoc* increase in pursuance of the agreement between the doctors of the Delhi hospitals and the Secretary of the Health Ministry arrived at on March 31, 1973.

Five hundred house surgeons, 350 interns and 650 postgraduate scholars (some of them outstation) are expected to be benefited from these orders.

The emoluments and other working conditions including the nomenclature of the services will be finally determined after the report of the Kartar Singh Committee is received by the Government. The tenure of the committee ends on September 30, 1973.

C. U. Invites Entries for Basanta Medals

The following topics of essay have been selected for competition for the annual award of the Basanta Medals by the Calcutta University for the years noted against them :

1972—Public Health Problems of a Metropolitan City.
1973—Health Begins at Home.

The medal valued at Rs. 250/- will be awarded to the author of the best essay on each topic. The competition for the medals is confined to the undergraduate students only of institutions, both medical and nonmedical, affiliated to Calcutta University.

Candidates desirous of competing for the medal should submit three copies of their essay, printed or type-written, to : Estates and Trust Officer, Calcutta University, Senate House, Calcutta 12, not later than *30th November, 1973.*

V International Seminar at London on Rehabilitation of Disabled People

Mr. Ian R. Henderson, Secretary General, British Council for Rehabilitation of the Disabled, announces :

The Fifth International Seminar and Exhibition will take place in The Central Hall, Westminister, London, S.W.1, on July 1—5, 1974.

The theme will be : Rehabilitation of Disabled People —The New Era.

Particulars may be had of The Conference Secretary, R.E.H.A.B., Tavistock House (South), Tavistock Square, London, WClH 9LB.

Delhi Skin Institute Arranges Refresher Course

A short refresher course in Dermatology will be held on November 19-30, 1973, at the Skin Institute, Delhi. The course, conducted by Prof. P. N. Behl, is intended mainly for medical practitioners and general duty officers in different services.

Applications for attending the course may be sent to the Director, Skin Institute, 5A Mathura Road, Jangpura, New Delhi 14, not later than *30th September, 1973.*

Cardiological Society of India Celebrates Silver Jubilee

Cardiological Society of India celebrated its Silver Jubilee in course of a 3-day conference held at Calcutta on 4-6 August, 1973.

Attended by representatives from almost all the cardiological centres in the country, the Conference provided an effective scientific forum for exchanging views on cardiological practice and its varied problems. The symposia on Cardiac Pace Maker and Tetralogy of Fallot drew large audience and evinced keen interest of the delegates. The scientific papers totalling about 90 and touching almost all aspects of cardiology, gave a glimpse of the scientific fervour with which cardiologists were working throughout the country.

The occasion had an added attraction in the joint sessions of the cardiothoracic surgeons and the physicians which facilitated a comprehensive approach to the regional problems.

The Silver Jubilee Oration, a special feature of the session, was delivered by Dr. J. C. Banerjea of Calcutta on Rehabilitation of Cardiac Patients.

Besides making nice arrangements for the accommodation and entertainment of the delegates, the Organising Committee brought out a Souvenir which was attractive both for its rich contents and get-up.

Apartheid Brought to Operation Table

An Indian doctor was thrown out of an operation theatre in a Cape Town Hospital in South Africa because a white nurse objected to his presence. His woman patient was already under an anaesthetic at the moment.

The Indian doctor, Dr. O. A. Brey, had been called in by a white gynaecologist, Dr. Wulf Utian, to assist at the operation. When he entered the operation theatre, the nurse discovered, for the first time, that he was an Indian, and objected to his presence.

The White hospital superintendent was summoned and, after a brief discussion, Dr. Brey left the theatre. A white doctor took his place.

Dr. Brey waited in the hospital waiting room until the operation was over, and his patient had been wheeled back to her ward.

The incident has caused shock in the medical circles all over the world, according to a report in *The Observer*, London.

Baby Battering : A Leading Cause of Infant Deaths in U.S.

Baby battering is probably a leading cause of death among children in the United States, according to a top New York paediatrician, Dr. Vincent J. Fontana, medical chairman of the New York Foundling Hospital.

Dr. Fontana recently told an American medical society meeting at New York that as a medical-social disease of endemic proportions child abuse was becoming more entrenched in the society.

"On record there are thousands of children deaths attributed to 'sudden infant deaths' (such as) falls, strangulation, burns, starvation, maternal deprivation, sexual assaults and gross battering", he said.

At least 700 children die annually in the United States under such circumstances, he disclosed.

He suggested that every medical centre should have a child abuse committee providing a readily available team of consultants whose first responsibility would be to aid the child, but which would also talk with the parents, be careful to submit the required legal information, and testify in court when required.

REVIEWS

Museum Guide of the Institute of History of Medicine ; Part I—Comp. by V. V. Ramana Rao, I.C.M.R., New Delhi, 1970, 22.2 cm. × 14.4 cm., pp. viii+54, Rs. 4/-. **Part II**—Comp. by V. V. Ramana Rao and Ed. by D. V. Subba Reddy, I.C.M.R., New Delhi, 1971, 22.2 cm. × 14.4 cm., pp. xviii+82, Rs. 8/-.

"The first section of tht Museum is devoted to the development of medicine in general, in space and time, in different countries and in different epochs of civilisation". The second section is devoted to the history of medicine in India beginning from ancient times.

Both the sections are rich with paintings, sculptures, charts, archaeological findings, etc., which give evidence of indefatigable industry and patience. Both Guides have plates and texts. The first gives a plan of the Museum ; the second gives an introduction to the main sub-divisions, Ayurveda, Unani, Modern Medicine as also short preliminary notes before some important periods of History of Medicine. The guides are informative and rewarding reading.

We hope the museum will grow from more to more to the glory of ancient medicine both of India and the rest of the world.

Subodh Datta

Biology of Senescence ; Problems and Perspectives—By R. K. Pal, 1972, The Asiatic Society, Calcutta, 24.3 cm. × 16 cm., pp. 8+52 ; Rs. 10. $2.00. 18 s. (Asiatic Society Monograph Series Vol. XXIII).

The why of senescence and death is still an unsolved mystery. Changes that herald the approach of senility leading to death have been under serious study for sometimes now. The author has described the changes in the physiology of old age, system by system. He has not forgotten the mind of the old man. Changes in the composition and function of the tissues that bring on deterioration of physiological function and their final cessation have been described. There is failure or death of individual cells throughout the body. Brain cells remain exceptionally stable and healthy when cells in other parts of the body are failing.

In the last chapter he has given suggestions for attaining longevity with health particularly when ageing process is now appearing later due to modern medicine and hygiene. He ends by saying that there cannot be any universal recipe for all old people.

The book is a good resume of present knowledge of senescence.

Subodh Datta

Introduction to Functional Voice Therapy—By Deso A. Weiss, 1971, S. Karger, Basel, Munchen, Paris, London, New York, Sydney, 17 cm. × 12.3 cm., pp. V+93. Price not mentioned.

Voice therapy has been and still is largely empirical. Laryngologists, perforce, have to treat voice disorders. But the only treatment one can usually offer is voice rest. It is easy to diagnose faulty use of voice but extremely difficult to teach its correct use. Music teachers also find this problem with their pupils. Often, the pupil would sing in a pitch which does not suit his voice. It is easy to point this out but quite another thing to get him to use the pitch that really suits.

The author is an expert both in the field of laryngology and that of music and he has offered some simple remedial exercises for the voice disorders that are usually seen. He has professedly avoided all theoretical discussions and instead has offered some very practical hints for the non-medical phoniatrist. The book would be useful for a probationer voice therapist at the beginning of his career but hardly of any use either for the expert in this field or for the E.N.T. specialist.

Sujit Ghosh

Auscultation of the Heart with Notes on Observation and Palpation—By R. W. D. Turner, Fourth Edition, 1972, Churchill Livingstone, Edinburgh and London, 18.8 cm. × 12 cm., pp. vii+122. £1.00.

The first edition of the booklet appeared in 1963 and rapidly became widely used by the students of medicine. In this updated and somewhat expanded copy of the fourth edition discussions on Observation and Palpation have been added in a very commendable manner which as the author states would facilitate diagnosis by auscultation. Brief summaries of the common cardiac disorders at the end of the book has been very valuable. The primary strength of the book is the exceptionally high calibre of the author as a teacher and a clinician. The text is lucid, succinct and authoritative. The book certainly fulfils the objective of providing medical students with the essential of bedside cardiology. The illustrations are clear and the printing excellent.

The present edition maintains the high standards of the previous ones, and the solid reputation with which the book has been associated has again been achieved.

J. C. GHOSE

OBITUARIES

Dr. P. C. Guha

Dr Purna Chandra Guha, a member of the I.M.A. Kharagpur Branch, passed away on 15-5-73 following a heart attack.

Born in 1903 at village Khanpur in the Manikgunj subdivision of Dacca (now in Bangla Desh) Dr. Guha received his early education at Tangail (also in Bangla Desh). He passed his I.Sc. examination from Jagannath Inter College, Dacca, and qualified himself for the profession from Dacca National Medical Institute. He started his practicing career as an assistant to Dr. Umaprasanna Ghosh, a renowned physician of Dacca. Later he settled down at his native village.

After the Independence Dr. Guha came over to Kharagpur in the Midnapur district of West Bengal and resumed his private practice. He joined the I.M.A. Kharagpur Branch in 1956 and was actively connected with the Branch for many years.

Dr. Guha leaves behind his wife, two sons and three daughters.

Dr. V. P. Athawale

Death took place on 8-7-73 of Dr. V. P.Athawale, a senior and active member of I.M.A. Bhandara (Maharashtra) Branch. He was 75.

After qualifying himself as an L.M.P. from Nagpur, Dr. Athawale joined the Army Medical Service under the then Government of India. On release from war service he joined the State Government service and was posted as an A.M.O. for Jails. On retirement he settled down at Bhandara and started private practice in which he shortly proved his skill and popularity.

Dr. Athawale is survived by his wife, three sons and a daughter.

Dr. M. D. Patel

Dr. Manubhai Dahyabhai Patel was born in East Africa and also received his early education there. His was a brilliant academic career. He graduated in medicine from Grant Medical College, Bombay, and obtained his master's degree in surgery in 1950. A year later he joined the teaching staff of the Medical College and S.S.G. Hospital, Baroda, in an honorary capacity. Side by side he built up a large practice in surgery and became one of the leading surgeons in the city.

In 1961 Dr. Patel went abroad for higher training in urology. In 1968 he was appointed a Fellow of International College of Surgeons, Chicago.

Dr. Patel had many scientific publications to his credit. He contributed articles not only for leading Indian medical journals but would often write on para-medical subjects in reputed magazines, which made interesting reading for his characteristic humorous style and lucidity. He was also keenly interested in flying and was a founder-member and a past President of Gujarat Flying Club, Baroda. His other hobbies included painting and public speaking. His talks on medical and non-medical subjects were broadcast from All-India Radio on several occasions.

Dr. Patel passed away on 19-6-73 at the age of 53. He leaves behind two sons, one of them a surgeon and a daughter who is a medical student.

DR. M. D. PATEL

DR. P. H. SHAH

Dr. P. H. Shah

Dr. P. H. Shah, a member of the Navsari (Gujarat) Branch of I.M.A., passed away on 13-5-73 at a very ripe age. After qualifying for the profession he entered the Government health service. Later he joined the Naranlal Metal Works Ltd. at Navsari as Hony. Medical Officer and started private practice, which he carried for about three decades. He was a kind-hearted man and used to render free medical service to many poor patients.

Dr. M. S. Patel

Dr. Maganbhai S. Patel, a member of the Baroda Branch of I.M.A., passed away on 19-4-73. He was suffering from uraemia.

Born on 3-5-1914 at Nar town in the Kaira district of Gujarat Dr. Patel, graduated in medicine from Grant Medical College, Bombay. From his college days he displayed keen interest in wrestling and sports for which he won many prizes. He was also a zealous exponent of the Indian classical music and the Yoga. Side by side with his professional career, he made his mark in these fields.

Dr. Patel leaves behind his wife, five sons and two daughters. His eldest daughter is a well-known sitar artist and his eldest son a Kathak dancer, both of whom are now in U.S.A.

SUPPLEMENT

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State Medical Conference

XXIV Orissa State Medical Conference

The 24th annual conference of the Orissa State Branch of I.M.A. was held on December 2-3, 1972 at Burla. The conference was inaugurated by Sri R. N. Mohanty and presided over by Dr. Sukumar Das.

At the inaugural function Dr. D. N. Tripathy, Chairman of the Reception Committee, welcomed the delegates and visitors from different parts of Orissa. Dr. B. K. Nandy, Hony. State Secretary, presented the annual report of the State Branch, wherein he narrated the activities of the State Branch during the year and gave an account of the various relief measures undertaken by the State Branch for the cyclone-affected areas of Orissa and the medical aid rendered to the refugees from Bangladesh.

Inaugurating the conference Sri Mohanty called upon the doctors to come forward to serve the rural population which was yet to receive the benefit of modern medical aid and health care. Dr. Sukumar Das, the outgoing President, formally installed Prof. Jyotsna Dei as the President of the State Branch for 1972-73. Following this Prof. Dei delivered her presidential address in course of which she surveyed the various urgent problems before the medical profession in the State and urged the members of I.M.A. to move unitedly to tackle the same. Dr. R. N. Mishra, Organising Secretary, 24th Orissa State Medical Conference, proposed the vote of thanks following which the inaugural session concluded.

The scientific session, which was an important feature of the conference, had two sittings presided over by Prof. S. C. Misra and Prof. Sukumar Das, respectively. Prof. A. Sarangi received the running cup for best original scientific paper contributed during the session 1971-72. Dr. (Mrs) Nirupama Rath was presented with a running trophy for attending the maximum number of conferences consecutively. Dr. V. Prakash Rao announced an award to be given away to an internee who would recruit the maximum number of doctors as members of the Association.

Several important resolutions were adopted in the conference. It was decided to approach the State's health authorities once again to elicit the views of the latter on the various problems of doctors in employment before chalking out a further course of action. The State Government was requested to permanently absorb the doctors working on *ad hoc* basis. The State Government was also requested to explore avenues for employment of unemployed doctors and to provide suitable incentives for the young doctors to enable them to set up practice in rural areas. A programme aimed at activising all the branches of the Association was adopted in the conference.

A variety entertainment programme was arranged at the end of the conference. The items presented by the students and staff of the V. S. S. Medical College, Burla, including the playlet written by Dr. B. K. Nanda for this occasion, delighted the delegates and the guests. The delegates were later taken around the Hirakund Dam, Deogarh Waterfalls and Ushakothi Sanctuary.

Branch Notes

ASSAM STATE BRANCH

Tangla Branch -At a meeting held on 2-2-72 at Pancery Tea Estate's Hospital with Brig. L. Nandkeolyar in the chair, the following were elected office-bearers :

President- Brig. L. Nandkeolyar (Pancery T. E) ; Vice-President—Dr. S. C. Dev (Hatigor T. E) ; Hony. Secretary and Treasurer—Dr. S. M. Das (Dimakuchi T. E.).

Following the election Dr. S. C. Chakravarty of Bhooteachang read a paper on Epistaxis—Its Cause and Management. Dr. and Mrs. S. Nundy entertained the members to dinner.

At a meeting held on 14-6-72, Dr. S. M. Das, Hony. Secretary, discussed letters from the Chairman of I.M.A. Tea Garden Doctors Action Committee and briefly reported the proceedings of the State Medical Conference and the Tea Garden Doctors Convention held at Tinsukia in March last. Following this Dr. J. K. Roy of Hatigor T. E. presented a paper on Amoebiasis. Two doctors—Dr. J. K. Gogoi and Dr. B. Sarma—enrolled themselves as members in this meeting. Dr. N. C. Das entertained the members and the guests to refreshment.

At a meeting held on 2-8-72 the election of three Vice-Presidents to the I.M.A. (Centre) was conducted. The members resolved to put on protest badges on 1-9-72 in observance of the Private Medical Practitioners Demands Day. Following this Brig. Nondkeolyar gave a talk on Congestive Heart Failure and Its Treatment. Dr. J. K. Gogoi of Budlapara Estate entertained the members to tea.

BENGAL STATE BRANCH

Ashokenagar Branch —The annual general meeting was held on 16-12-72 with Dr. B. Banerjee in the chair. The following were elected office-bearers for the year 1972-73 :

President—Dr. B. B. Banerjee ; Vice-Presidents—Dr. S. C. Mazumdar and Dr. Sadhan Sen ; Hony. Secretary—Dr. J C. Chowdhury ; Treasurer—Dr. U. P. Chatterjee.

Bagnan Branch—At a general meeting the following were elected office-bearers for 1972-73 :

President—Dr. Gopi Krishna Chakrabarty ; Hony. Secretary—Dr. Rabindranath Ray ; Representatives to State Council—Dr. Gopi Krishna Chakraborty and Dr. Krishna Pada Pal.

Balagarh Branch—At a general meeting the following were elected office-bearers for 1972-73 :

President—Dr. A. K. Ghose ; Vice-President—Dr. B. Sen and Dr. S. K. Roy ; Hony. Secretary—Dr. Kali Pada Bandyopadhyay; Treasurer—Dr. L. N. Sengupta; Representative to State Council—Dr. K. P. Bandyopadhyay; Convener, Clinical Meetings—Dr. A. B. Chatterjee.

Bally-Belur-Lillooah Branch—At a general meeting held on 3-12-72 the following were elected office-bearers for 1972-73 :

President—Dr. K. K. Gupta; Vice-Presidents—Dr. G. Banerjee, Dr. R. N. Pal and Dr. S. C. Das; Hony. Secretary—Dr. Satyananda Chatterji; Jt. Secretaries—Dr. B. K. Roy, Dr. S. P. Chatterji and Dr. A. Sen; Treasurer—Dr. B. N. Ganguly; Representatives to State Council—Drs. B. N. Ghose, K. N. Paria, Aloke Banerjee and Satyananda Chatterjee; Representative to Central Council—Dr. Biswanath Ghose; Members of Executive Committee—Drs. S. N. Chatterjee, S. L. Chatterjee, B. K. Dey, (Mrs.) Mamata Sarkar, Barin Dutta and Biswanath Ghose.

Baranagar Cossipore Branch—The annual general meeting was held on 12-12-72 at the residence of Dr. Subhas Kumar Das. Dr. S. K. Das Gupta presided. After adopting the annual report and the statement of accounts for 1971-72 the house elected the following as office-bearers for 1972-73 :

President—Dr. N. K. Dev Ray; Vice-President—Dr. C. D. Dutta; Hony. Secretary—Dr. Subhas Kr. Das; Asstt. Secretary—Dr. Dipak Sen Gupta; Treasurer—Dr. B. Bose; Members of Executive Committee—Drs. K. P. Basak, K. L. Chatterjee, J. M. Sengupta and Ashis Ghosh; Representatives to State Council—Dr. Subhas Kr Das and Dr. Dipak Sengupta; Representative to Central Council—Dr. Ashis Ghosh.

Behala Branch—The annual general meeting was held on 19-11-72 at Behala Hospital premises. In the annual report placed by the Hony. Secretary mention was made of clinical meetings including the Dr. Hiran Chatterjee Memorial lecture presided over by Dr. P. K. Dutta and observance of Health Week through a programme of baby show, child health examination and socio-medical lectures on Tuberculosis and Cancer. The branch condoled the death of Dr. J. B Chatterjea, an internationally reputed haematologist and that of Dr. Chandidas Roychowdhury, a member and a patron of the branch. It also gave a farewell to Dr. P. K. Bhadra, a member of the branch, on the eve of his departure for England.

The following were elected office-bearers for 1972-73 :

President—Dr. Debapriva Bose; Vice-President—Drs. Dilip Banerjee, Shibapada Basu and Brahmapada Dutta; Hony. Secretary—Dr. Subir Das· In-charge, Scientific Section—Dr. Shymapada Roychowdhury; In-charge, Organisational Affairs—Dr. Jugal Mukherjee, In-charge, Entertainment Section—Dr. Bikash Chowdhury; Treasurer—Dr. Sushil Sen; Internal Auditor—Dr. Panchanan Nayak; Members of the Executive Committee—Drs. Santosh Kumar Mukherjee, Jiten Banerjee, Kamal Banerjee, Manoranjan Das, Monorath Panja and Ashim Mitra; Representatives to State Council—Drs. B. K. Bhattacharya, Subir Das, Santosh Mukherjee and Shyamapada Mukherjee. Representative to Central Council—Dr. B. K. Bhattacharya.

Berhampur Branch—At the general meeting the following were elected office-bearers for 1972-73 :

President—Dr. Ajit Kumar Banerjee; Hony. Secretary—Dr. Samiran Kumar Chaudhuri; Representative to Central Council—Dr. Samiran Kumar Chaudhuri.

Burdwan Branch—At the annual general meeting the following were elected office-bearers for 1972-73

President—Dr. S. N. Mukherjee; Vice-Presidents—Dr. Sailendranath Bhattacharjee and Dr. N. G. Maitra; Secretary—Dr. K. C. Chaudhury; Asstt. Secretary—Dr. Anil Ghosh; Treasurer—Dr. A. B. Patra; Members of Executive Committee—Drs. Dibakar Das, Madan Kundu, N. C. Datta, B. B. Sarkar, Sacchidananda Das, Ashis Ranjan Banerjee, Promod Hazra, K. S. Ahmad and D. N. Roy; Representative to Central Council—Dr. Subodh Mukhopadhyaya; Representatives to State Council—Drs. N. G. Maitra, K. S. Ahmad, N. C. Dutta and Anil Ghosh.

Champdani Bhadreswar Branch—The annual meeting was held at the Clinic of Dr. Baidya Nath Sreemany. Dr. Niren Chakravarty, C.M.O.H., Angus Jute Works, presided. Dr. Khagendra Kr. Ghosh, Treasurer, placed the statement of accounts which was adopted. The following were elected office-bearers for 1972-73 :

President—Dr. Bimal Chatterjee; Vice-President—Dr. Niren Chakravarty; Secretary—Dr. Baidya Nath Sreemany; Jt. Secretary—Dr. Nirendra Lal Tripathi; Treasurer—Dr. Khagendra Kr. Ghosh; Representative to Central Council—Dr. Bimal Chatterjee; Representative to State Council—Dr. Baidya Nath Sreemany and Dr. Chandi Charan Sardar; Representatives to E.S.I. Standing Committee—Dr. Chandi Ch. Sardar and Dr. Baidya Nath Sreemany.

Chandernagore Branch—At the annual general meeting held on 12-11-72 at Institut De Chandernagore, the following were elected office-bearers for 1972-73 :

President—Dr. R. G. Nandy; Vice-Presidents—Dr. S. P. Chatterjee and Dr. S. Sadhu; Hony Secretary—Dr. M. B. Talukdar; Jt. Secretary—Dr. B. K. Pramanick; Treasurer—Dr. R. N. Pal; Auditor—Dr. J. C. Das; Representative to Central Council—Dr. R. M. Ghose; Representatives to State Council—Dr. Aurobindo Ghosh, Dr. (Mrs.) Suniti Ghosh and Dr. S. C. Roy.

Chittaranjan Branch—A meeting was held on 6-10-72 with Dr. M. M. Chawla in the chair. At the outset the Hony. Secretary read out his address of welcome to Dr. Chawla, who had been recently elected President of the branch. The Hony. Secretary solicited cooperation of the members for furthering the objectives of the Association. Following this there was a brief discussion on observance of All-India Private Medical Practitioners Demands Day and it was decided to send a brief report of the observance prepared by the former Hony. Secretary Dr. H. B. Tapadar, to the Action Committee of I.M.A.

Later Dr. Tapadar presented a case of rare combination of pulmonary tuberculosis and tuberculosis meningitis in a 4-year old baby. Following him Dr. A. B. Roy, Hony. Secretary, presented a post-operative case of intestinal obstruction due to adhesion after 9 months of vagotomy and gastrojejunostomy.

A meeting was held on 18-11-72 with Dr. Chawla in the chair. The house considered a circular from the State Branch on 3-year diploma course in medicine. The meeting expressed its disapproval for the proposed course and extended its full support to the resolution as adopted by the State Council of I.M.A. In response to the proposal of Dr. K. C. Chowdhury, Hony. Secretary, Burdwan Branch for forming a District Coordination Committee of General Practitioners, the meeting requested the President, the Vice-Presidents and the Hony. Secretary of the branch to attend the first meeting of the body. By courtesy of Sandoz Ltd. members were shown three films : (1) Heart Transplantation; (2) Quest for Health; (3) Prof. V. N. Shirodkar's Technique of Tuboplasty.

At a meeting held on 8-12-72 the scheme of Burdwan District Coordination Committee suggesting division of the I.M.A. organisation in Burdwan into separate autonomous units under the State Branch was considered. The house could not agree to the scheme. It expressed the view that prior approval of the State Branch and the Headquarters should have been taken by the sponsors and it therefore decided to seek the guidance of the State Branch in this matter. Later Dr. M. C. Mullick presented a paper on Cardiac Arrhythmias in General Practice. Dr. A. B. Roy demonstrated a case of illeo-illeal intussusception.

Dubrajpur Branch—At a general meeting held on 17-9-72 at the chamber of Dr. B. Dey, the following were elected office-bearers for 1972-73 :

President—Dr. N. K. Saha ; Vice-President—Dr. P. K. Mitra and Dr. B. K. Chowdhury ; Secretary and Treasurer—Dr. G. C. Saha ; Representative to State Council— Dr. B. Dey.

It was decided to finalise selection of representative to the Central Council in consultation with the neighbouring Suri and Sainthia Branches.

Garbeta Branch—At the annual general meeting held on 1-10-72 the following were elected office-bearers for 1972-73 :

President—Dr. T. B. Ghosh ; Hony. Secretary—Dr. S. C. Roy ; Representatives to State Council—Dr. S C. Roy and Dr. J. P. De ; Representative to Central Council-- Dr. J. P. De.

Gardenreach Branch—The annual general meeting was held on 28-10-72 at the Association Hall. The following were elected office-bearers for the year 1972-73 :

President—Dr. L. N. Chatterjee ; Vice Presidents—Drs. H. D. Kolay, Hrishikesh Pal and P. K. Roy ; Secretary—Dr. P. B. Das ; Asst. Secretaries—Dr. M. M. Das and Dr. H. R. Kundu ; Treasurer--Dr. H. R. Kundu ; Members of Executive Committee—Drs. B. K. Kundu, P. Basu, A. B. Roy Chowdhury, K. K. Pal, P. N. Pramanick, N. C. Mukherjee, Himanshu Kr. Pal and K. K. Bose ; Representative to Central Council—Dr. K. K. Bose ; Representatives to State Council—Drs. A. B. Roychowdhury, K. K. Bose and L. N. Chatterjee.

Hooghly Chinsurah Branch—The annual general meeting was held on 31-8-72 at the District Health Office building at Babugang. Dr. K. C. Mallick took the chair. The Hony. Secretary informed the house of the *ad interim* injunction order on the election of office-bearers held on 6-2-72 and the declaration of the results thereof. In view of the vacation of the order as per verdict of the court the President could now declare the results of the aforesaid election. The Hony. Secretary outlined the programmes in connection with the observance of Private Medical Practitioners Demands Day and Health Week. Appealing to all members to work unitedly henceforth for the cause of the Association the President declared the following as elected uncontested as office-bearers and members of Executive Committee :

President—Dr. Kartic C. Malick ; Vice-Presidents - Dr. N. K. Dey and Dr. Provat Dutta ; Hony. Secretary—Dr. Sachin Nag ; Jt. Secretaries—Dr. D. Nandy and Dr. J. Chakraborty ; Treasurer—Dr. Kshitish Mohan Sadhu Khan ; Auditor—Dr. S. Malick ; Representative to Central Council—Dr. K. C. Malick ; Representatives to State Council Drs. K. C. Malick, J. C Chakraborty, Subodh Nag and K. S. Sadhu Khan ; Members of Executive Committee—Drs. Sanat Ghosh, K. C. Dutta, S. Bhandey, S. Kundu, Sudhir Bose, B. L. Kundu, S. Roy, J. N. Bose, S. Dey and S. Nag.

Howrah Branch—At the annual general meeting the following were elected office-bearers for 1972-73 :

President—Dr. Sisir Kumar Sen ; Hony. Secretary—Dr. Sudhir Chandra De ; Representatives to Central Council—Drs. Sisir Kumar Sen, Sudhir Chandra De and Dandapani Banerjee.

Jagatdal Branch—The annual meeting was held on 28-9-72 at the Anglo India Jute Mill Club premises. The annual report was placed by the Hony. Secretary which was adopted. The following were elected office-bearers for 1972-73 :

President—Dr. Atul Chakraborty ; Vice-Presidents—Drs. (Mrs) Rubi Biswas, Bimal Kanti Mukherjee and Shyam Sundar Mukherjee ; Hony. Secretary—Dr. Pashu Pati Sinha ; Joint Secretaries—Drs. J. P. Mukherjee, I. B. Ganguly, P. R. Naha and N. P. Mukherjee ; Representatives to State Council—Drs. Pashu Pati Sinha, Ajit K. Banerjee, D. Sen Gupta and Paritosh Sthanpati ; Representative to Central Council—Dr. H. P. Rai Chowdhury ; Treasurer—Dr. Sanjib Chatterjee ; Auditor—Dr. P. K. Nag.

Kalyani Branch—The annual general meeting was held on 1-10-72 at the Kanchrapara T.B. Hospital Doctors' Recreation Club Hall. Dr. Santosh Kumar Mitra took the chair. Dr. K. C. Basu Mallick, Director of Health Services, West Bengal, was present as the Chief Guest. The Hony. Secretary Dr. Syamaprasad Majumdar placed the annual report for the year 1971-72. The President in course of his address referred to the lacunae in Government's rural health policy and its failure to protect doctors in service from the unjustifiable vilification campaign being carried on against them by a section of the press and the public. Replying Dr. Basu Mallick enumerated the difficulties of the Government in translating their policies into action and deplored the lack of a sense of responsibility and scant regard for truth shown by a section of the press. In the clinical session that followed Dr. Basu Mallick spoke on Auto-immune Diseases and Dr. Joydeb Prasad on Management of Shock. Some foreign scientific films were screened by the courtesy of W.B.N.V.P.

The following were elected office-bearers for 1972-73 :

President—Dr. Kalipada Sen Gupta ; Vice-Presidents—Drs. Nirmal Chandra Sen Gupta ; Bibhuti Bhusan Das and Gour Mohan De ; Hony. Secretary---Dr. Syamaprasad Majumdar ; Jt. Secretaries- Dr. Kshitish Chandra Roy and Dr. Abdul Hasnat ; Representatives to State Council -Drs. Syamaprasad Majumdar, Radha Shyam Bhakta, Sudhindra Nath Chatterjee and Debasish Bal ; Representative to Central Council—Dr. Jasha Prakash Basu.

Kharagpur Branch—At the annual meeting held on 23-9-72 the following were elected office-bearers for 1972-73 :

President—Dr. A. K. Mondal ; Vice-President—Dr. S. N. Panda ; Hony. Secretary—Dr. A. K. Chakraborty ; Treasurer— Dr. S. K. Nag ; Members of Executive Committee—Drs. B. B. Chakraborty, D. N. Pal and (Mrs) K. Banerjee.

At another meeting held on 8-10-72 Drs. A. K. Chakraborty, N. K. Bakshi, S. K. Nag and D. N. Pal were elected representatives to State Council and Dr. H. K. Guha was elected representative to Central Council.

Konnagar Branch—The annual general meeting was held on 29-10-72 at the Konnagar High School premises. Dr. N. Banerjee took the chair. The following were elected office-bearers for 1972-73 :

President—Dr. N. Banerjee ; Vice-President—Dr. G. C. Dutta ; Secretary—Dr. A. K. Das ; Asst. Secretary—Dr. A. K. Banerjee ; Treasurer—Dr. P. K. Deb ; Representatives to State Council—Dr. D. Mukherjee and Dr. A. K. Das ; Auditor—Dr. B. Das ; Representative to E.S.I. Standing Committee—Dr. A. K. Banerjee.

Krishnagar Branch—At the annual general meeting the following were elected office-bearers for 1972-73 :

President—Dr. Sailendra Nath Sanyal ; Vice-President—Dr. Prosad Kumar Mondal ; Hony. Secretary—Dr. Birendra Chandra Ghose ; Representative to Central Council—Dr.

Birendra Chandra Ghose; Representatives to State Council—Drs. M. N. Roy, B. C. Ghose and A. N. Sarkar.

Midnapore Branch—The annual general meeting was held on 30-10-72 in the new building of I.M.A. at Battala Chawk with Dr. M. Das in the chair. At the outset the meeting condoled the demise of Dr. Nalini Ranjan Sengupta, a noted physician of West Bengal and a member of I.M.A. After adopting the Hony. Secretary's report and the statement of accounts the house elected the following as office-bearers for 1972-73 :

President—Dr. M. Das; Vice-Presidents—Drs. S. K. Mondal, K. C. Dutta and M. Dutt; Hony. Secretary—Dr. R. Banerjee; Jt. Secretaries—Dr. B. N. Mondal and Dr. B. S Das; Auditor—Dr. A. K. Pramanik; Treasurer—Dr. D. N. Sinha; Representatives to State Council—Drs. R. Banerjee, K. D. Dutt, S. K. Mondal and M. Das.

Nabadwip Branch—The annual general meeting was held on 31-10-72, Dr. R. M. Saha presiding. The following were elected office-bearers for the year 1972-73 :

President—Dr. R. K. Bhattacharyya; Vice-President—Dr. R. M. Saha; Hony. Secretary—Dr. N. N. Saha; Jt. Secretary—Dr. A. K. Kundu; Representative to Central Council Dr. (Capt.) A. K. Nath; Representatives to State Council—Dr. N. N Saha and Dr. S. N. Mukherjee.

Noapara Branch—The annual general meeting was held on 23-9-72 at the chamber of Dr. P. K. Das. The following were elected office-bearers for the year 1972-73

President—Dr. D. B. Chatterjee; Vice-Presidents—Dr. Joygopal Chandra and Dr. K. C. Bagchi; Hony. Secretary—Dr. P. K. Das; Jt. Secretaries—Dr. Sushil Ganguly and Dr. S. R. Maity; Treasurer—Dr. K. C. Bagchi; Representative to Central Council—Dr. P. K. Das; Representatives to State Council—Drs. R. N. Pal, A. K. Roy and B. N. Sadhukhan.

North Howrah Branch—At the annual general meeting held on 10-12-72 the following were elected office-bearers for 1972-73 :

President—Dr. Salil Kr. Ghosh; Hony. Secretary—Dr. Banabehari Kar; Representative to State Council Drs. B. Lahiri, Banabehari Kar, B. De Sarkar and Salil Kr. Ghosh; Representative to Central Council—Dr. B. De Sarkar.

Panihati Branch—The annual general meeting was held on 29-10-72 in the Sushil Krishna Sikshyatan for Girls, H. B. Town, Sodepur. Dr. N. C. Das, a senior member of the branch, took the chair. Dr. C. R. Roy, Hony. Secretary, placed his report for the year 1971-72. He stated that during the Indo Pak hostilities members of the branch rendered service to the national cause by actively cooperating with the local civil defence authorities. The branch organised jointly with the Regional Peace Committee a meeting for bringing about peace and harmony during disturbances in the area. Besides observing World Health Day the branch undertook health examination of students of a primary school. It also arranged a clinical talk on Cardiac Emergencies in General Practice. Following the report the statement of accounts was placed by Dr. A. K. Sengupta, Hony. Treasurer. The house adopted both the reports and a plan for construction of building of the branch. The following were elected office-bearers for 1972-73 :

President—Dr. R. N. Biswas; Vice-Presidents—Drs. J. N. Mallick, C. H. Dutta and S. K. Banerjee; Hony. Secretary—Dr. C. C. Roy; Jt. Secretaries—Drs. B. K. Nandi and H. R. Halder; Treasurer—Dr. A. K. Sengupta; Members of the Executive Committee—Drs. D. P. Nandi, S. K. Sur, S. K. Biswas, (Mrs) Usha Chakraborty, K. K. Kanjilal and D. P. Chakraborty; Representative to Central Council—Dr. K. K. Kanjilal; Representatives to State Council—Drs. C. R. Roy, A. K. Sengupta and K. K. Kanjilal.

Raniganj Branch—At the annual general meeting held on 12-11-72 the following were elected office-bearers for 1972-73 :

President—Dr. B. Dutta; Vice-Presidents—Drs. K. K. Gupta, D. Kundu and K. B. Sengupta; Hony. Secretary and Treasurer—Dr. M. K. Loyalka; Representative to Central Council—Dr. Samaresh Chandra Ghosh; Representatives to State Council—Drs. K. B. Sen Gupta, M. K. Loyalka and P. N. Kundu.

Sainthia Branch—At the annual general meeting the following were elected office-bearers for 1972-73 :

President—Dr. Shyam Sundar Pal; Vice-President—Dr. Tinkari Banerjee; Hony. Secretary—Dr. Ramendra Nath Chatterjee; Jt. Secretary—Dr. Anil Kumar Das; Treasurer—Dr. S. N. Ghosh; Representative to Central Council—Dr. B. Jhunjhunwalla.

Tarakeswar Branch—At the annual general meeting held on 14-11-72 the following were elected office-bearers for 1972-73 :

President—Dr. H. S. Dutta; Hony. Secretary—Dr. G. S Dhara; Representative to Central Council—Dr. J. C. Biswas.

Titagarh Branch—The annual general meeting was held on 26-11-72 at Arya Vidyalaya Titagarh. Dr. (Mrs) Mira Banerjee took the chair. Dr. Amiya K. Chatterjee, Hony. Secretary, stated in his report that the membership strength of the branch, which was 74 for this year, had been almost stationery in spite of fresh enrolments due to dropping out of a few members every year. The branch observed the World Health Day along with its annual function, which was attended among others by Sri Ajit Kumar Panja, Health Minister, Sri Subrata Mukherjee, State Minister for Home Affairs, Sri R. K. Ganguly, S.D.O., Barrackpore and Dr. Gouri Sankar Mukherjee, President, Bengal State Branch.

After adopting the statement of accounts placed by Dr. B. Das and the annual report the house elected the following as office-bearers for 1972-73 :

President—Dr. (Mrs) Mira Banerjee; Vice-Presidents—Dr. Sujan Kumar Das and Dr. Bibhuti Sinha Roy; Hony. Secretary—Dr. Amiya Kumar Chatterjee; Asst. Secretaries—Dr. Nripendra Ch. Ghosh and Dr. Bhola Nath Sur; Treasurer—Dr. Brindaban Das; Members—Drs. Gadadhar Banerjee, Girija Mohan Chatterjee, Sishir Bhattacharyya, Prabir Mukherjee, Shiva Prosad Ghosh, Santosh K. Chakravarty and Bimal Banerjee; Representatives to State Council—Drs. Girija Mohan Chatterjee, Amiya K. Chatterjee, Mihir K. Mukherjee and Bhola Nath Sur; Representative to Central Council—Dr. Girija Mohan Chatterjee.

BIHAR STATE BRANCH

Dumka Branch—A general meeting was held on 26-11-72 in the Sadar Hospital premises with Dr. I. N. Jha in the chair. Placing his report the Hony. Secretary thanked the members for their cooperation in the membership enrolment drive undertaken during last July, which resulted in an increase in membership.

The following were elected office-bearers for 1972-73 :

President—Dr. A. N. Ghosh; Vice-President—Dr A. K. Das; Secretary—Dr. H. N. Biswas; Jt. Secretary—Dr. R. K. Singh; Auditor—Dr. A. R. Sen Gupta; Representative to State Council—Dr. M. Prasad; Representative to Central Council—Dr. A. P. Verma.

Hajipur Branch—A meeting was held on 11-10-72 at the residence of Dr. Damodar Prasad, Dr. S. B. Singh took the chair. It was unanimously decided in the meeting to request the State Branch to open negotiations with the State Government regarding revision of pay scales and improvement of service conditions of Government doctors on the following lines :

1. Recommendation of the 2nd Pay Revision Committee should be implemented without any further delay.

2. The State Service cadre of Government doctors should be a practising one with a practising scale as per the charter of demands submitted to the Government by the Bihar State Branch of I.M.A.

3. The existing 17 per cent of promotional avenues should be made at least 33 per cent on seniority basis.

4. Provisions should be made for postgraduate allowance, rural and difficult area allowance, risk allowance, free quarters or house-rent allowance, conveyance allowance and other fringe benefits.

5. Duty hours of Government doctors should be fixed at 6-8 hours daily.

6. Work on Sundays and holidays should be suitably compensated in the form of compensatory leave.

7. Government doctors should be exempted from court attendance as in case of chemical examiners, otherwise separate doctors like police surgeons should be posted and entrusted with medico-legal work.

8. There should be a full-time superintendent (non-medical) and full-time medical officer for all sub-jails as there are in district and central jails.

9. The cadre of Government doctors should be separated as teaching cadre and general cadre. There should not be *inter se* posting at any stage between two different cadres.

10. The entire medical service should be nationalised.

Siwan Branch—An emergent meeting was held on 28-10-72 in the premises of Siwan Hospital with Dr. S. R. Verma in the chair. The meeting adopted a resolution expressing strong resentment at the inhuman treatment meted out to the doctors of Chaibasha hospital by some rowdies. Expressing deep anxiety over the increase in the number of such incidents, the meeting requested the Government and the Bihar State Branch of I.M.A. to take necessary steps to prevent recurrence of the same. In another resolution the meeting congratulated Dr. A. K. N. Sinha, President of I.M.A. (1971-72), on his election as Vice-President of the Commonwealth Medical Association.

CHANDIGARH TERRITORIAL BRANCH

An emergent meeting was held on 27-10-72 to voice the protest of the branch against the high-handed and brutal conduct of police and administrative authorities at Patiala on 24-10-72 when the Principal of the Patiala Medical College was manhandled and even beaten along with the student representatives who had been invited for a negotiation on 24-10-72. The meeting also condemned the action of the police in ransacking the rooms of the student's hostel and destroying their property on 25-10-72, while talks were being held with Secretary, Health Department, Punjab Government. The meeting appealed to the Punjab Government to institute a judicial enquiry by a High Court judge into the deplorable incidents and appealed to the staff and students of all medical colleges and hospitals in Punjab to restore normalcy immediately in the interest of the patients and public.

The annual report of the Territorial Branch for the year 1971-72 was placed by the Hony. Secretary Dr. K. C. Bhargava at a general meeting. Referring to the membership strength of the branch, which had increased from 72 to 78, Dr. Bhargava stressed the need for extending the activities of the Association and for making serious efforts in order to enrol new members, particularly from among the younger doctors to get over the static position. During the year the branch had 15 general meetings including 7 scientific meetings and 6 social meetings. In several meetings important topics of medico-political interest were discussed. A general meeting was organised in connection with the controversial statement about doctors issued by the Director of Health Services, Punjab. The meeting was attended by a large number of members of the teaching staff and students of P.G.I. M.E.R., Chandigarh, and the stand taken by the I.M.A. was widely appreciated. The branch successfully organised a meeting in observance of the All-India Protest Day and sent a delegation to Chief Commissioner to explain to him the I.M.A.'s viewpoints. On the occasion of the World Health Day it held a well-attended seminar at the P.G.I.M.E.R.

The following were elected office-bearers for the year 1972-73 :

President—Prof. Inderjit Dewan ; Vice-Presidents—Dr. Man Mohan Singh and Dr. Y. Gupta ; Hony. Secretary—Dr. K. C. Bhargava ; Jt. Secretary—Dr. B. S. Cheema ; Treasurer—Dr. Ram Pratap ; Member of Central Working Committee of I.M.A.—Dr. I. G. Jolly ; Representative to various committees Dr. Kuldeep Singh ; Representative to Central Council—Dr. R. C. Mahajan ; Members of Executive Committee—Dr. J. R. D. Ahuja, Baljit Singh, R. L. Banga, V. K. Verma and B. B. Dhir.

DELHI STATE BRANCH

During the period October 1972 to January 1973 the State Branch lost six members. In separate condolence meetings the State Branch paid respectful homage to the departed souls and adopted resolutions conveying heartfelt sympathy to the bereaved families

The members were : Dr. Gopal Das Jain of Sadar Bazar, Delhi ; Dr. Balwant Kaur of Burakhamba Road, New Delhi ; Dr. S. C. Mathur and Dr. Des Raj of Daryaganj Delhi ; Dr. Udham Singh of Connaught Place, New Delhi and Dr. Tara Chand Parakh of Maliwara, Delhi.

GUJARAT STATE BRANCH

Jhalod Branch—Members of the branch observed All-India Private Medical Practitioners' Demands Day on 1-9-72 by wearing protest badges and holding a meeting where a resolution was passed on the demands of the private practitioners. A copy of the resolution was forwarded to the Prime Minister and a copy of I.M.A's memorandum on this issue was submitted to the local authorities. Earlier the branch held a press conference and a socio-medical gathering to popularise the demands of I.M.A.

Kalol-Halol Branch—In observance of the Private Medical Practitioners' Demands Day the branch observed a meeting and adopted a resolution, a copy of which was forwarded to the Prime Minister. It also submitted a copy of the I.M.A.'s memorandum to the Collector of Panchmahal. All members of the branch put on protest badges.

Sihor-Amargadh Branch—This new branch of I.M.A. in the Bhavnagar district was formed on 1-10-72 with a total of ten members. Dr. K. C. Rasgoi of K. J. Mehta T.B. Hospital, Amargadh and Dr. R. J. Shah of Government Hospital, Sihor, were elected President and Hony. Secretary, respectively.

Vyara Branch—The new branch in the Surat district came into being effect from 1-10-72 with 10 members on the roll. Dr. F. K. Shah of Mochiwad and Dr. H. K. Vyas of Fort, Vyara were elected President and Hony. Secretary respectively.

KERALA STATE BRANCH

The following were elected office-bearers of the State Branch at the 16th State Medical Conference held at Hotel Alakapuri at Calicut on 12-11-72 :

President—Dr. N. Mohandas (Calicut) ; Senior Vice-President—Dr. C. B. Parasuram (Calicut) ; Vice-Presidents—Dr. M. J. Kuru Villa (Palghat) and Dr. K. V. Madhvan Nair (Cannanore) ; Hony. Secretary—Dr. A. Thyagarajan, (Chakkorathukulam, Calicut) ; Joint Secretaries—Drs. T. B. F. Moniz (Madhya Kerala), T. V. Jose (Kottayam) and K. K. Verma (Trivandrum) ; Treasurer—Dr. A. Ramanathan (Calicut) ; Central Working Committee Members—Dr. (Capt.) A. B. Dass (Kozhikode) and Dr. C. V. Krishnamoorthy (Palghat) ; Alternate Members—Dr. (Major) O. K. Sankaran (Kozhikode) and Dr. C. R. Parasuram (Kozhikode) ; Editor, *Kerala Medical Journal*—Dr. M. G. Sahadevan (Kozhikode) ; President Faculty of I.M.A. College of General Practitioners—Dr. M. Mohandas (Calicut).

The conference adopted a resolution requesting the Government of Kerala to ban medical camps conducted by unqualified persons in the State and called upon all members of the Association particularly those who were attached to different Service Clubs and Societies to see that their organisations were not involved in sponsoring of such medical camps by unqualified persons.

MADHYA PRADESH STATE BRANCH

The following were elected office-bearers of the State Branch for 1972-73 :

President—Dr. N. K. Chaube (Rajnandgaon) ; Vice-Presidents—Drs. R. G. Gour (Indore), N. R. Bhandari (Bhopal) and S. S. Shrivastava (Jabalpur) ; Hony. State Secretary—Dr. V. P. Khare (Jabalpur) ; Joint Secretary—Dr. D. K. Gupta (Jabalpur) ; Treasurer—Dr. P. K. Pradhan (Jabalpur) ; Representatives to Central Working Committee of I.M.A.—Dr. R. N. Chatterjee (Jabalpur) and Dr. R. A. Bhagwat (Indore) ; Alternate Representatives—Dr. V. P. Khare (Jabalpur) and Dr. R. G. Gour (Indore) ; Zonal Representatives of the State Branch—Dr. S. R. Dhakad (Indore Zone), Dr. N. D. Vaishya (Gwalior Zone), Dr. A. K. Tiwari (Rewa Zone), Dr. R. C. Parikh (Raipur Zone) and Dr. Y. Rahim (Jabalpur Zone).

The following were elected office-bearers of the I.M.A. College of General Practitioners :

Chairman and Representative to Governing Body at the Centre—Dr. R. K. Mishra (Jabalpur) ; Secretary—Dr. C. K. Tiwari (Jabalpur) ; Jt. Secretary—Dr. (Miss) Lekha Pathak (Jabalpur). Dr. G. P. Vyas and Dr. V. K. Bhave were elected Secretary and Joint Secretary respectively of *Madhya Pradesh Medical Journal.*

MAHARASHTRA STATE BRANCH

Anjangaon Branch—At a general meeting the following were elected office-bearers for 1972-73 :

President—Dr. K. M. Pampasettiar ; Vice-President—Dr. Ingule ; Hony. Secretary—Dr. (Miss) A. K. Hore ; Jt. Secretary—Dr. R. M. Sarada.

Bombay West Suburban Branch—The annual meeting was held on 24-12-72. Dr. P. B. Vartak took the chair. Dr. D. A. Kothari and Dr. A. G. Kale, Joint Secretaries, placed the annual report for the year 1971-72. They stated in their report that the branch had 139 members on the roll including two life members and 16 couple members. During the year the Managing Committee met 8 times. The branch befittingly observed the World Health Day and arranged a panel discussion on the theme 'Your Heart is Your Health'. It also observed the Private Medical Practitioners' Demands Day by sending a deputation to wait on the Chief Minister and the Health Minister at Sachivalaya and hand over copies of I.M.A.'s memorandum to them. It felicitated Dr. D. G. Palkar, a member of the branch, on his election to the Maharashtra State Legislative Assembly. During the year the branch held five scientific meetings where lectures were delivered by Drs. A. V. Bavdekar, N. C. Joshi. A. G. Kale, M. B. Wagale and A. K. Vaidya.

The following were elected office-bearers for 1972-73 :

President—Dr. N. R. Karode ; Vice-President—Dr. N. R. Purandare ; Hony. Secretary—Dr. (Miss) G. B. Malwankar ; Treasurer—Dr. N. K. Rao ; Members—Dr. (Mrs) P. M. Mangaokar and Dr. S. V. Tilak ; Representative to Central Council—Dr. N. R. Karode and Dr. (Miss) G. B. Malwankar ; Representatives to State Council—Drs. N. R. Karode, N. R. Purandare, P. G. Vartak, N. K. Rao and (Miss) G. B. Malwankar ; Representative to the Executive Committee of Maharashtra State Branch—Dr. (Miss) G. B. Malwankar.

Buldana Branch—The annual general meeting was held on 11-10-72 with Dr. V. S. Koundinya in the chair. Dr. S. N. Wanere, Hony. Secretary, placed the annual report and the audited statement of accounts for 1971-72 which were adopted by the house. According to the report the branch had 26 members on the roll and had held 13 monthly meetings and 3 special meetings. The monthly meetings were followed by clinical sessions where interesting cases were demonstrated by different doctors. The branch observed the World Health Day and the Private Medical Practitioners Demands Day with great enthusiasm. Members of the branch extended their help in raising donations for the local Dharmashala to facilitate accommodation for relatives of patients who came to Buldana for admission in the Government hospital.

The following were elected office-bearers for the year 1972-73 :

President—Dr. V. S. Koundinya ; Hony. Secretary—Dr. S N. Wanere ; Jt. Secretary—Dr. V. K. Darvekar ; Representative to State Council—Dr Gaharwar ; Representative to Central Council—Dr. M. Salik.

Dombivali Branch—During the period April September, 1972, the branch arranged a number of scientific lectures for the benefit of its members. The following were the speakers on different subjects. Dr. Prabhakar Rao—Minor Surgical Operations in General Practice ; Dr. H. T. Naik—Sterility in Males and Females ; Dr. S. D. Bapat—Common Errors in Diagonosis of Urological Diseases ; Dr. Damodar Vaze—Common Paediatric Diseases ; Dr. S. B. Ajgaonkar—Preventive Dentistry ; Dr. K. N. Varde—ABO Incompatibility in a Newborn ; Dr. S. G. Pimpalkhare—1) Brain Abscess, 2) Bronchial Carcinoma ; Dr. Bhat—1) Amoebic Liver Abscess, 2) Parkinsonism.

In the monthly meetings the members discussed issues like antitetanus immunisation drive among local industrial workers, medical check-up of school children, immunisation of children of hutment dwellers, starting of a recreation club with arrangements for indoor games and formation of Young Doctor's Forum. The branch took actions according to its organisational capacity in implementing the above programmes. The branch also moved in the matter of irregularities in the local Municipal Hospital, which were brought to the notice of the members by Dr. S. G. Pimpalkhare, Vice-President. It negotiated with the municipal authorities and pointed out the irregular manner in which the hospital was being run by the authorities. It also put forward certain suggestions for better and more efficient functioning of the hospital. The branch observed the Private Practitioners' Demands Day on 1-9-72. The members wore protest badges on this occasion and after holding a meeting they sent the I.M.A.'s memorandum to the Prime Minister of India and the Chief Minister and the Health Minister of the State.

At the annual meeting held on 8-9-72 the new executive body of the branch for 1972-73 was elected with the following :

President—Dr. S. G. Pimpalkhare ; Vice-President—Dr. U. P. Rao ; Secretaries—Dr. M. M. Navare and Dr. V. N. Tannu ; Treasurer—Dr. N. N. Thosar.

MYSORE STATE BRANCH

At the annual State Council meeting at 20-10-72 the following were declared elected as office-bearers for 1972-73 :

Hony. State Secretary—Dr. V. S. Achar ; Joint Secretary —Dr. B. T. Sampathkumar ; Treasurer—Dr. M. A. Narasimhachar ; Editor, Journal of the Mysore Medical Association—Dr. V. Parameswara ; Members of Central Working Committee of I.M.A.— Drs. K. Mohandas Pai, S. R. Giri Ranjan and M. A. Narasimhachar ; Alternate Members—Drs. K. S. Sreenivasa Murthy, A. V. Subramanyam and K. Thimmappiah ; Internal Auditor—Dr. M. K. Papanna.

Bangalore Branch—At a meeting held on 18-10-72 with Dr. S. R. Chandrasekhar in the chair, Dr. Maxwell Ellis spoke on Recent Trends in Otorhinolaryngology. Dr. T. N. Pai addressed the members on Garibi Hatao at a meeting held on 30-10-72. Dr. A. G. Narendra presided.

Dr. H. C. Nagabhusanaswamy, Associate Professor of Surgery and Dr. K. M. Prakash, Associate Professor of Skin and V.D., Bangalore Medical College, presented a few surgical and dermatological cases at a clinical meeting held at the Postgraduate and Research Institute, Bowring & Lady Curzon Hospitals, Bangalore, on 13-11-72. Dr. G. Desikachar, Associate Professor of Surgery, Victorial Hospital, took the chair. Dr. K. S. Shadaksharappa, a past President of the branch, was felicitated on 23-11-72 on his receiving the State Award of the Government of Mysore, 1972 for medicine. Later Dr. Krishna Bhargava, Professor of Pathology, Bangalore Medical College, spoke on Coronary Athersosclerosis. Dr. R. Rangappa, Professor of Medicine of the same college, took the chair. At a scientific meeting held on 30-11-72 Dr. (Mrs) V. K. Velva, a paediatrician from Bulgaria, spoke on Immuniglobulin Use in Prophylaxix and Therapy. Dr. V. Parameshvara presided.

Dr. G. Gopal, Associate Professor of Paediatric Surgery, Bangalore Medical College, spoke on Unusual Presentation of Spinabfida at a meeting held on 6-12-72. Dr. G. N. Narayana Reddy, Superintendent, Mental Hospital, Bangalore, took the chair. On 21-12-72 Dr. (Mrs) Devaki and Dr. Ganeshan from Oklahoma Clinical Research Centre, U.S.A., addressed the members on (i) Studies of Lipopretein with special reference to Their Role in Hyperlipoproteinaemia and (ii) General Concept and Management of Primary or Familal Hyperlipoproteinaemia. Dr. K. S. Shadaksharappa took the chair. At a meeting held on 30-12-72 Dr. Mohan Rao, plastic surgeon, Madras, spoke on Cleft Lip and Palate. Dr. K. S. Shekar, plastic surgeon, Victorial Hospital, Bangalore, took the chair.

ORISSA STATE BRANCH

The following were elected office-bearers for 1972-73 at the 24th annual conference of the State Branch :

President—Dr. Jyotsna Dei ; Vice-Presidents—Dr. G. M. Biswal and Dr. K. S. N. Rao ; Hony. General Secretary—Dr. Chandi Das ; Joint Secretaries—Dr. R. N. Panigrahi and Dr. R. N. Misra (No : II) ; Auditor—Dr. (Miss) Sukhalata Das ; Representative to I.M.A. Working Committee and Central Council—Dr. (Mrs) Nirupama Rath ; Alternate Member—Dr. Suresh Chandra Misra.

TAMILNADU STATE BRANCH

At the 26th Tamilnadu State Medical Conference held on Madurai Medical College in November 1972 the following were declared elected as office-bearers of the State Branch for the year 1972-73 :

President—Dr. C. Arumugam (Coimbatore) ; Senior Vice-President—Dr. N. V. Muthukrishnan (Tiruchirapalli) ; Vice-President—Dr. G. Ramachandramurthy (Madras) ; Hony. State Secretary—Dr. T. Thirugnanam (Madurai) ; Hony. Jt. Secretary—Dr. (Maj.) N. Chandrasekhar (Madras) ; Hony. Treasurer—Dr. A. Arunachalam (Madurai) ; Representative to the I.M.A. Working Committee—Drs. C. Arumugam (Coimbatore), A. Abdul Sathar (Madurai) and K. C. Nambiar (Madras) ; Alternate Representatives—Drs. V. Samuel (Madras), K V. Swamy (Madras) and H. Sripad Rao (Periyakulam).

Erode Branch—At the annual meeting held at Erode on 7-12-72 the following were elected office-bearers for 1972-73 :

President—Dr. S. E. Paul ; Vice-President—Dr. J. Sathya Sundari ; Hony. Secretary—Dr. K. M. Nallaswami ; Treasurer—Dr. N. Mukunda Sheney ; Representative to Central Council Dr. K. Balasubraniam.

Kanyakumari Branch—At the annual meeting held on 1-10-72 the following ere elected office-bearers for 1972-73 :

President—Dr. R. Pandyan ; Vice-President—Dr. A. B. Ramamurthy ; Hony. Secretary and Treasurer—Dr. S. Nagarajan ; Representatives to Central Council—Dr. S. Muthukaroppa Pillai and Dr. D. Jayaharan.

South Arcot Branch—At the annual meeting held on 1-4-73 the following were elected office-bearers for 1972-73 :

President—Dr. P. G. Verghese ; Vice-President—Dr. A. R. Reddy ; Hony. Secretary and Treasurer—Dr. D. Shunmugam ; Jt. Secretary—Dr. Razack ; Representative to Central Council—Dr. K. S. Krishnagopal.

UTTAR PRADESH STATE BRANCH

At the last annual conference of U.P. State Branch held at Faizabad on November 11-12-1972 the following were elected office-bearers for 1972-73 :

President—Dr. B. S. Mehta (Varanasi) ; Vice-President—Drs. S. N. Kapoor (Kanpur), A. L. Shah (Nainital) and R. P. Dhawan (Bahraich) ; Hony. State Secretary—Dr. K. P. Mehtorra (Kanpur) and Dr. D. N. Bose (Kanpur) ; Jt. Secretaries—Dr. Raj Kapoor (Kanpur) and Dr. A. K. Gupta (Varanasi) ; Members of the Working Committee—Drs. R. L. Jain (Kanpur), R. K. Jalota (Kanpur), (Mrs.) Vijay Gupta (Aligarh), Keshav Chandra (Kanpur), R. N. Gupta (Lucknow), G. P. Srivastava (Allahabad), R. K. Seth (Kanpur), B. K. Kapur (Kanpur), Y. D. Kapur (Faizabad) and J. S. Agarwal (Moradabad), Representatives of U. P. State Branch on the Central Working Committee of I.M.A. : Dr. B. S. Mehta (Varanasi), Dr. K. P. Mehrotra (Kanpur) and Dr. M. M. S. Siddhu (Lucknow); Alternate Representatives—Drs. Navin Chandra (Kanpur), A. K. Tandon (Lucknow) and Y. D. Kapur (Faizabad).

The following were elected office-bearers of U. P. State Faculty, I.M.A. College of General Practitioners, Lucknow, for the year 1972-73 :

Hony. Secretary—Dr. A. K. Tandon (Lucknow); Joint Secretary—Dr. T. N. Singh (Kanpur); Representatives on the Board of Faculty—Drs. B. K. Kapur (Kanpur), Mrs. Vijay Gupta (Aligarh) and Keshav Chandra (Kanpur) Representative of the U. P. State Council of I.M.A. College of General Practitioners—Dr. A. K. Tandon (Lucknow); Alternate Representative—Dr. B. K. Kapur (Kanpur).

Bareilly Branch—At the annual general meeting the following were elected office-bearers for 1972-73 :

President—Dr. Satish Chandra; Sr. Vice-President—Dr. V. P. Adya; Jr. Vice-President—Dr. O. P. Jaiswal; Secretary—Dr. Dinesh Johri ; Joint Secretaries—Dr. S. L. Bhasni and Dr. S. K. Srivastava; Treasurer—Dr. V. K. Agarwal; Members of Executive Committee Drs. K. B. Verma, A. K. Gupta, G. K. Srivastava, P. S. Agarwal, H. B. Gupta, D. P. Singh and (Mrs) I. Kutur (Lady Representative) ; Representatives to Central Council—Dr. H. C. Aron and Dr. Chaman Lal; Representatives to State Council—Drs. A. P. Verma, T. R. Khanna and P. Guha; Member of Hospital Advisory Committee—Dr. G. S. Dhillon; Public Relation Officer—Dr. Lalit Aga.

Etah Branch—A meeting was held on 24-10-72 at the residence of Dr. N. G. Bhaduri. Dr. K. D. Jain presided. At the outset nominations for the President and Vice-Presidents of I.M.A. (headquarters) were made. The house next considered several organisational matters. The view was expressed that no useful purpose would be served by issuing identity card to the members as proposed by local authorities. The house also decided in favour of contacting the M.P. and M.L.As from Faizabad and holding discussions with them on quackery. Dr. B. Roy Choudhury hosted a dinner to the members.

Death of Dr. M. P. Srivastava, Additional Civil Surgeon, Faizabad, due to heart failure as also of Dr. J. C. Gupta, Additional Civil Surgeon, Bahraich, who was murdered by unknown miscreants, was condoled at a meeting held in the district hospital. Dr. K. D. Jain presided.

At a meeting held on 29-5-72 at the residence of Dr. J. B. Khare nominations for the posts of Presidents and Vice-Presidents of the State Branch were finalised. Following this, letters from Lt. Col. K. C. Sekena, Dr. K. P. Mehrotra and Dr. Navin Chandra were read out and suitable actions were taken on them. The meeting closed with a dinner hosted by Dr. and Mrs. J. B. Khare.

A meeting was held on 26-6-72 at the Masonic Lodge Hall. At the outset a resolution was passed condoling the death of Dr. K. Sen Roy, founder President of the Branch. The meeting next considered the circulars received from the I.M.A. Headquarters and decided to request the State Branch and the Headquarters to take steps for implementing the suggestions contained therein as the local officers, with whom the local branch dealt, could not act without necessary orders from the State Government.

A farewell was given to Drs. K. M. Chandra, Vijai Pal, H. K. Verma, (Miss) U. Bhatnagar and (Mrs) P. Sharma on the eve of their transfer from this State. Dr. Y. D. Kapur, Dr. S. K. Khan and Dr. G. S. Patrick referred to the qualities of head and heart of the above members and thanked them for the cooperation they had extended to the branch during their stay at Faizabad. Dr. Vijai Pal and Dr. H. K. Verma replied to the falicitations. The meeting closed with a dinner hosted by Dr. (Mrs) F. E. Bramwell.

Elections of the office-bearers of the State Branch and the Centre were held at a meeting on 24-7-72. Dr. K. D. Jain was elected President of the branch and Dr. Y. B. Kapur, President of the Organising Committee for the State Medical Conference. Dr. R. D. Upadhyay hosted a dinner to the members.

At an emergent meeting held at the District Hall, Faizabad, Dr. N. D. Pandey and Dr. S. N. Jha gave an account of the assaults on them on July 27 and July 31 respectively. The branch passed a resolution expressing its great concern at the above incidents and requesting the local authorities and the State Government to take urgent action on the matter. A resolution was passed condoling the demise of Dr. Parmanand, a former member of the branch. The President called upon all medical officers of P. H.Cs to enrol themselves as members of I.M.A. so that the Association could effectively represent their cause.

The death of Prof. S. S. Mishra of Lucknow Medical College was condoled at a meeting held on 26-8-72 with Dr. S. N. Gupta in the chair. The meeting also reviewed the progress with regard to the ensuing U.P. State Medical Conference. Dr. K. K. Ghose entertained the members to dinner following which the meeting closed.

At a meeting held on 30-9-72 with Dr. K. D. Jain in the chair, the Hony. Secretary gave a report of his tour of Sultan and Gonda. It was decided that the delegation fee for all delegates attending the conference on behalf of their branches should be paid from the Association Fund. The meeting closed with a dinner hosted by Dr. R. N. Mishra.

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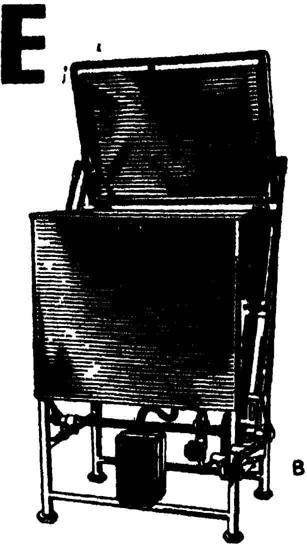

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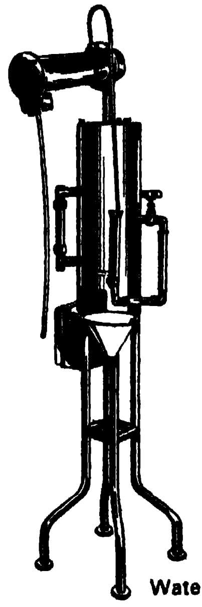

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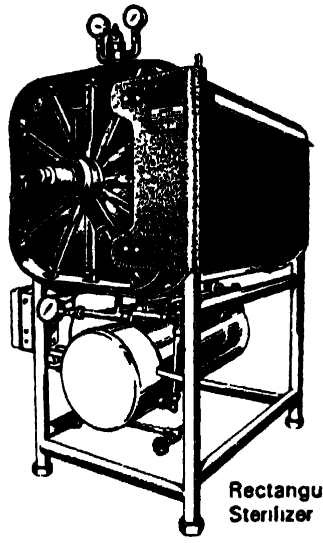

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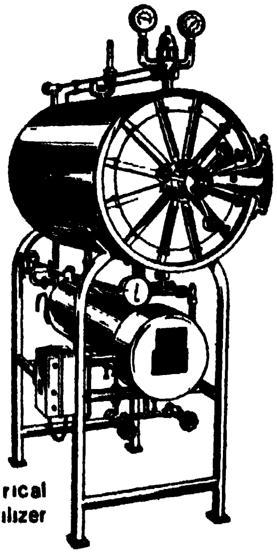

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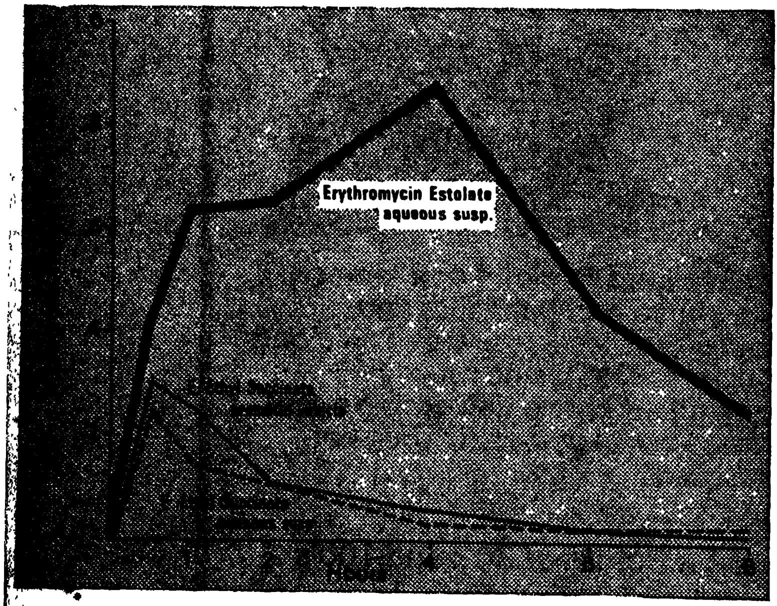

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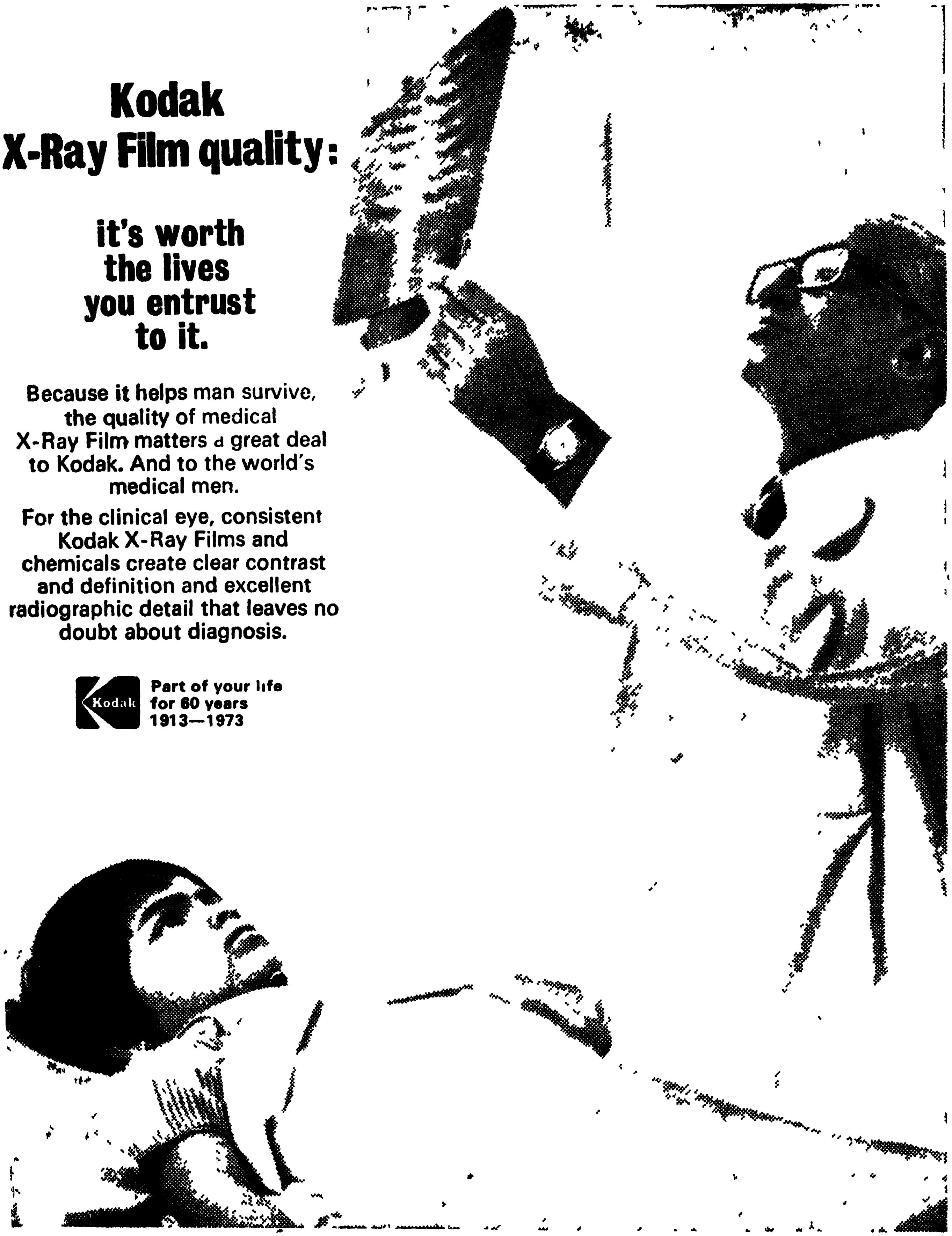

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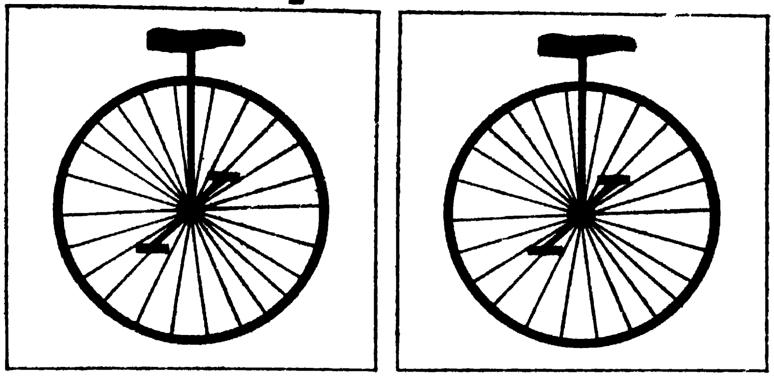

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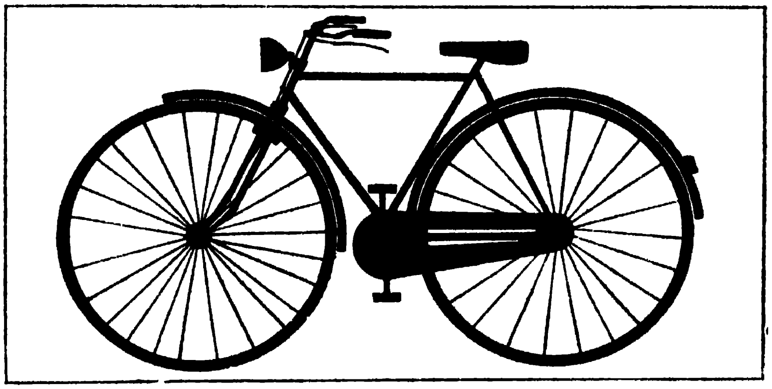

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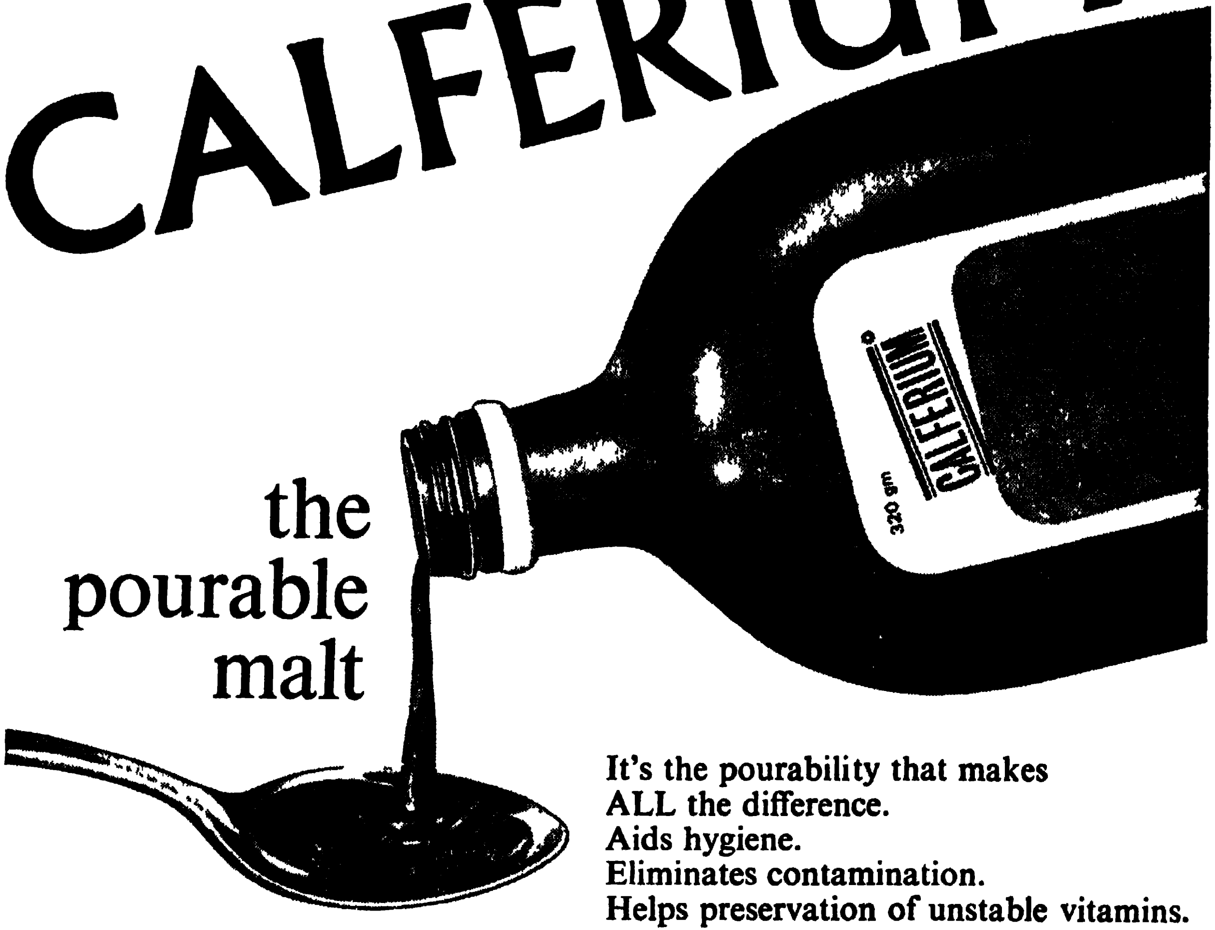

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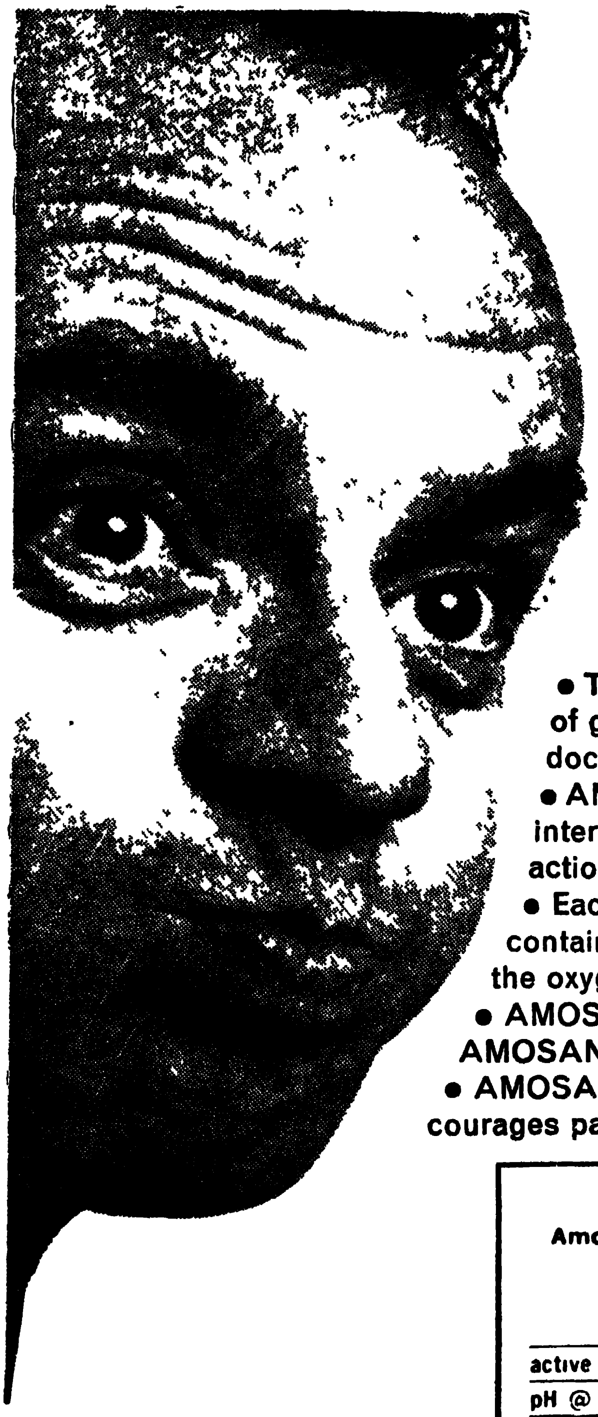

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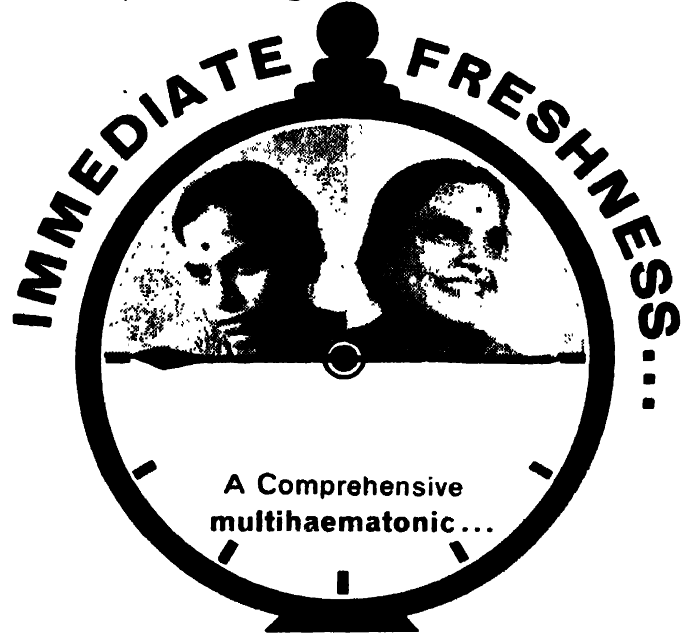
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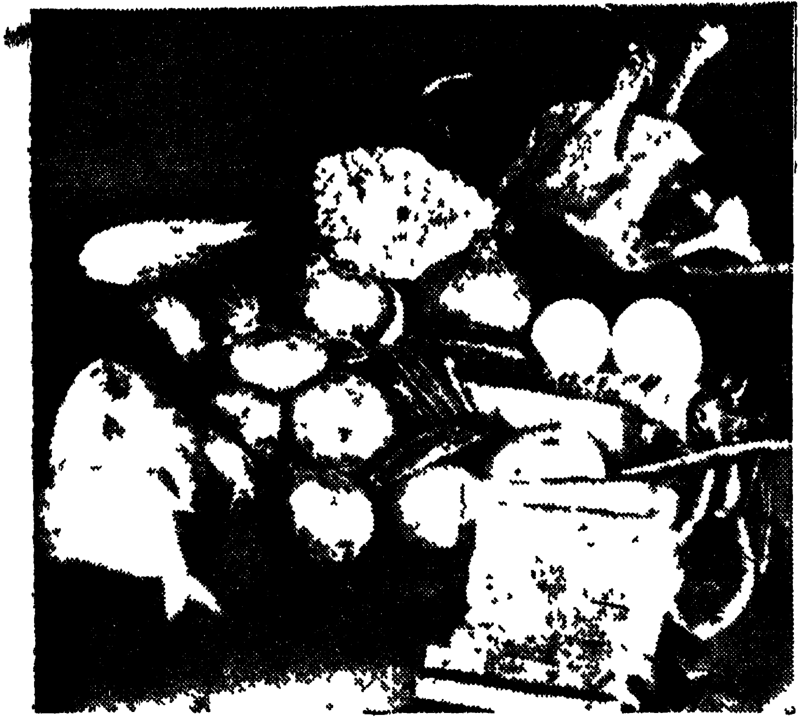

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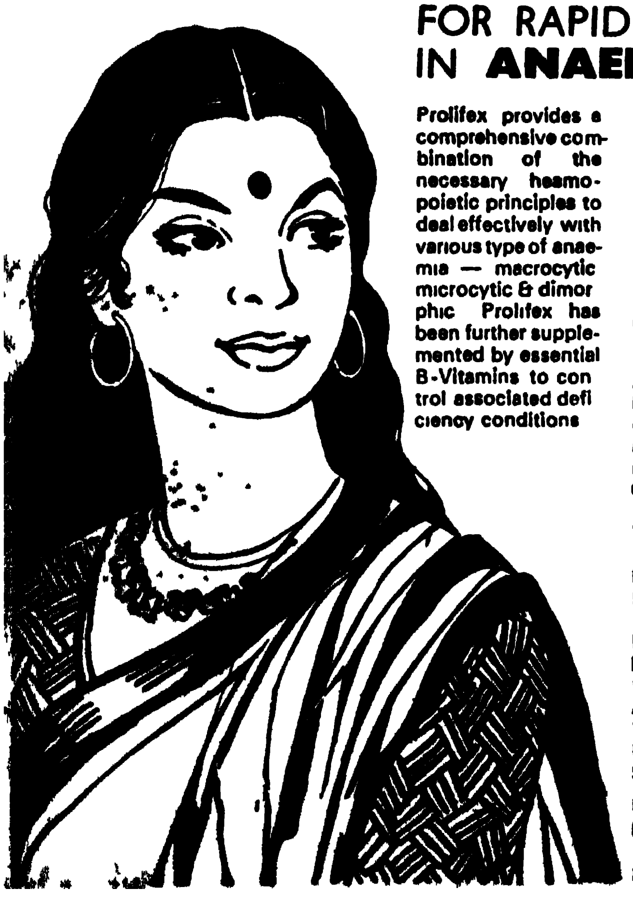

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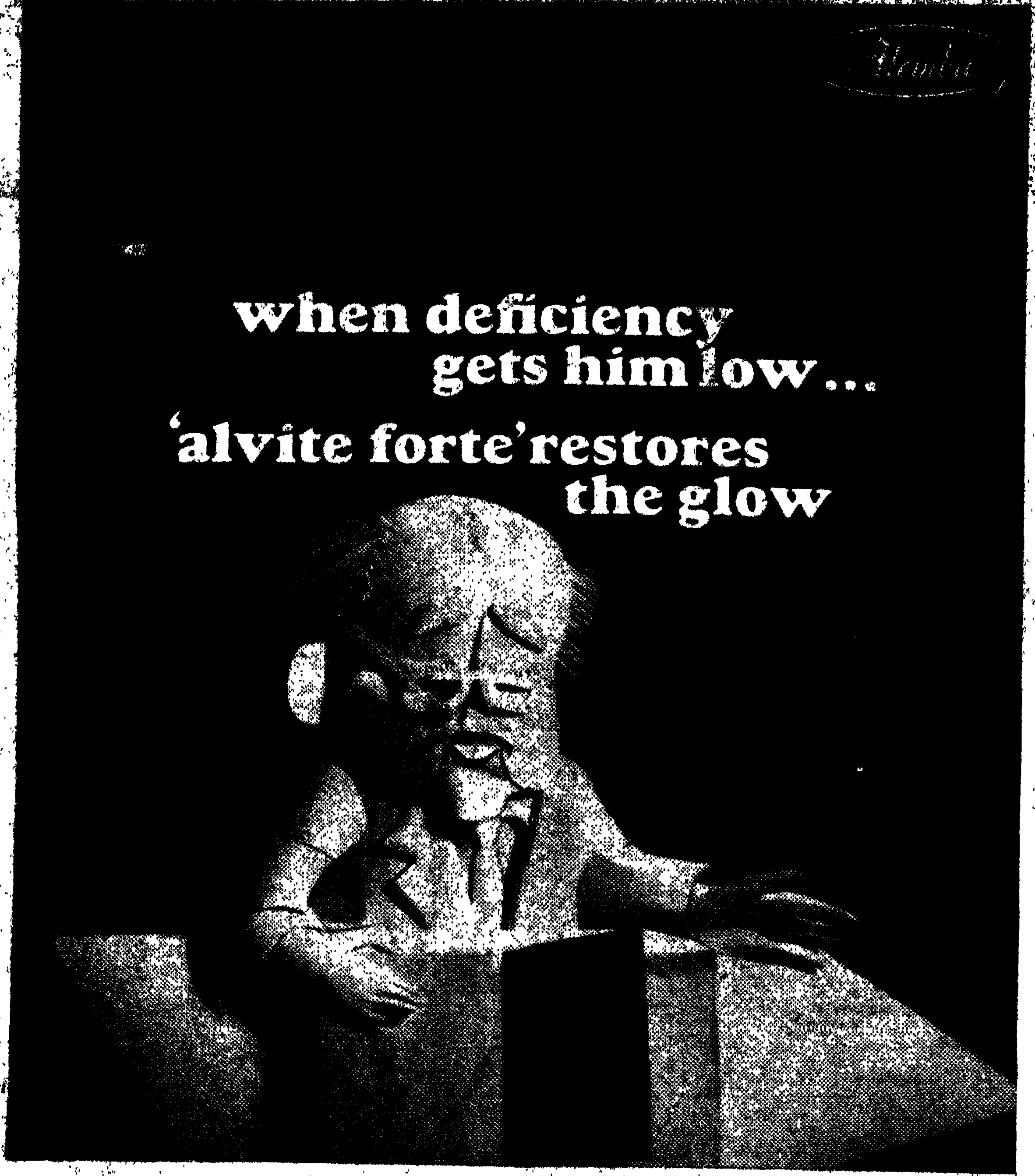

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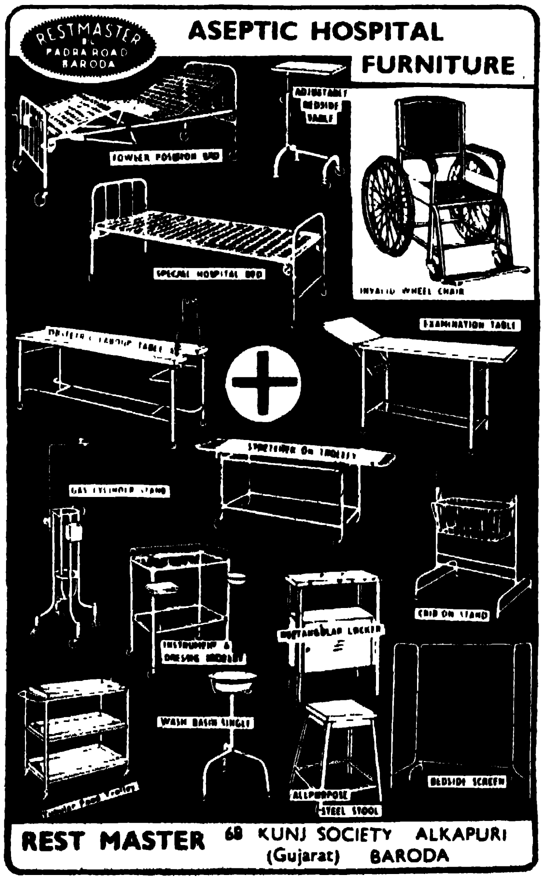

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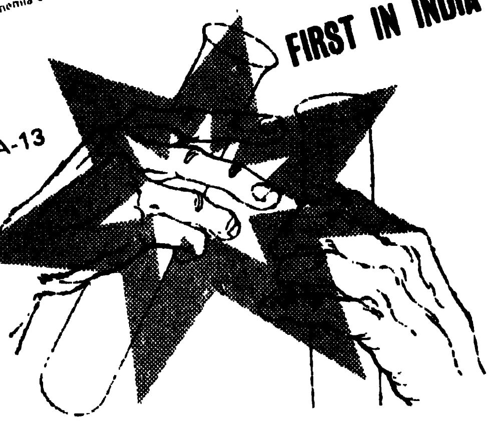

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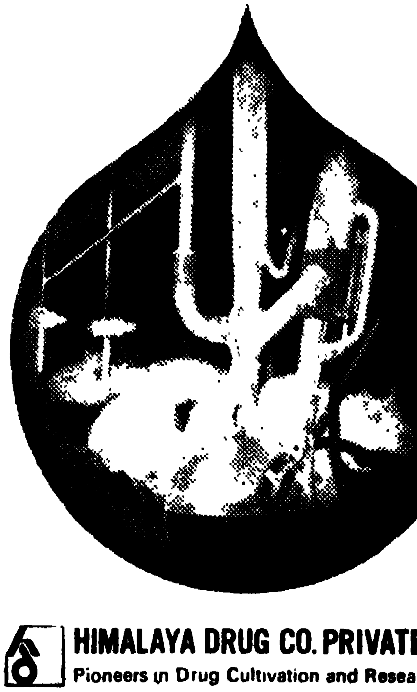

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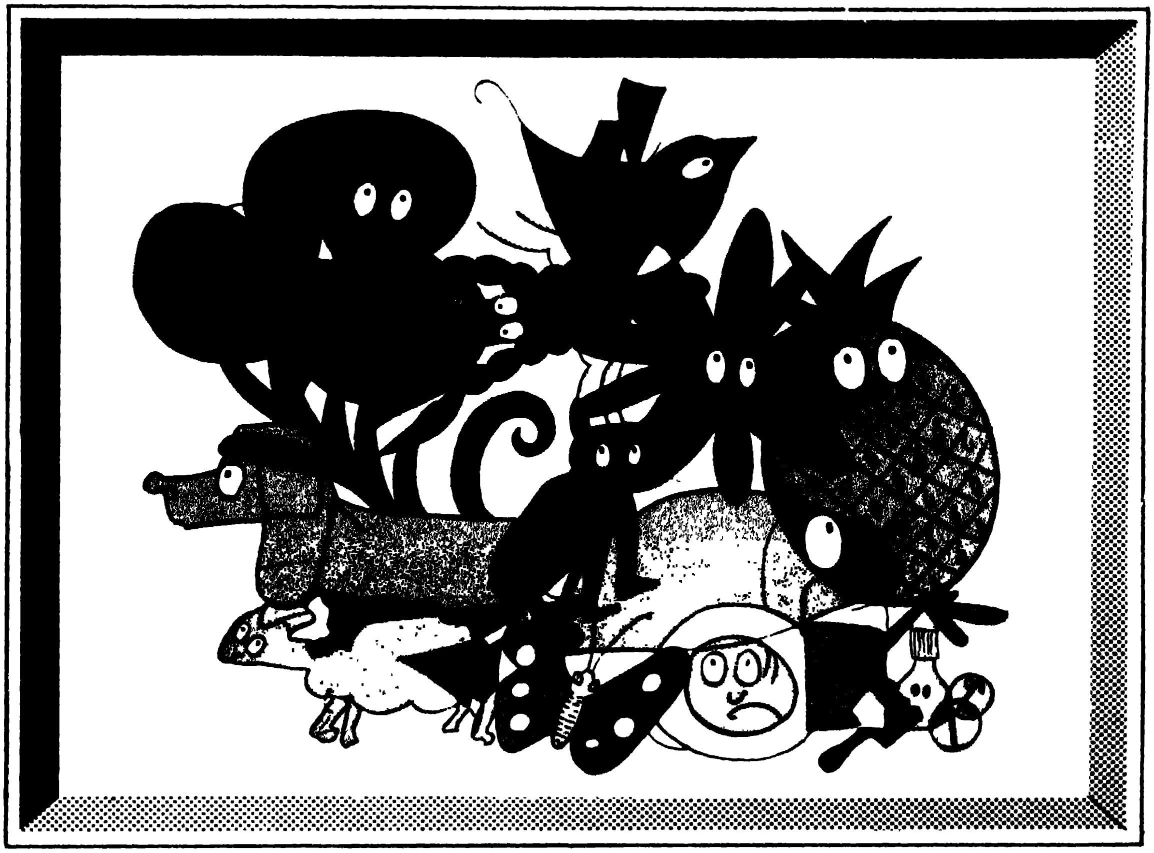

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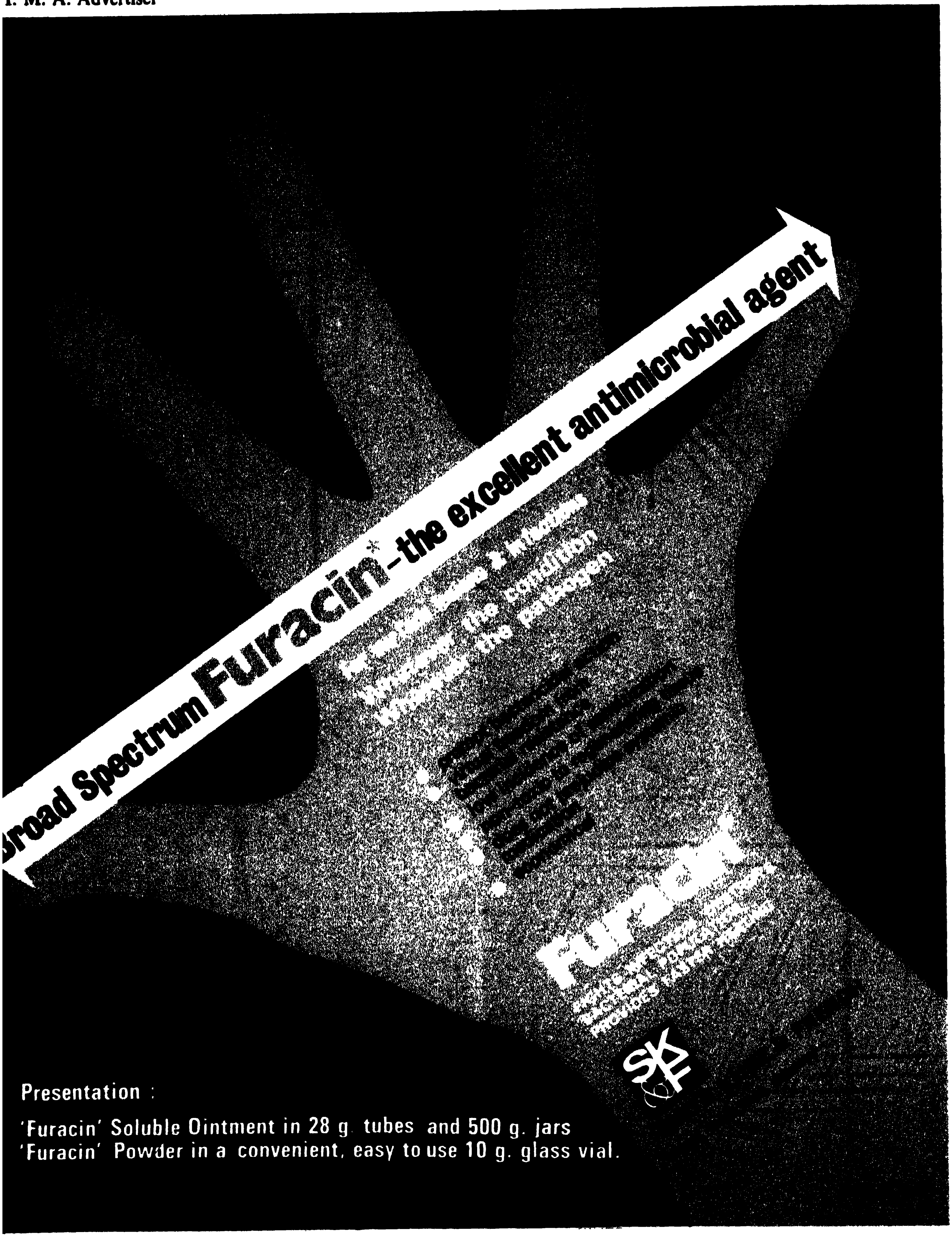
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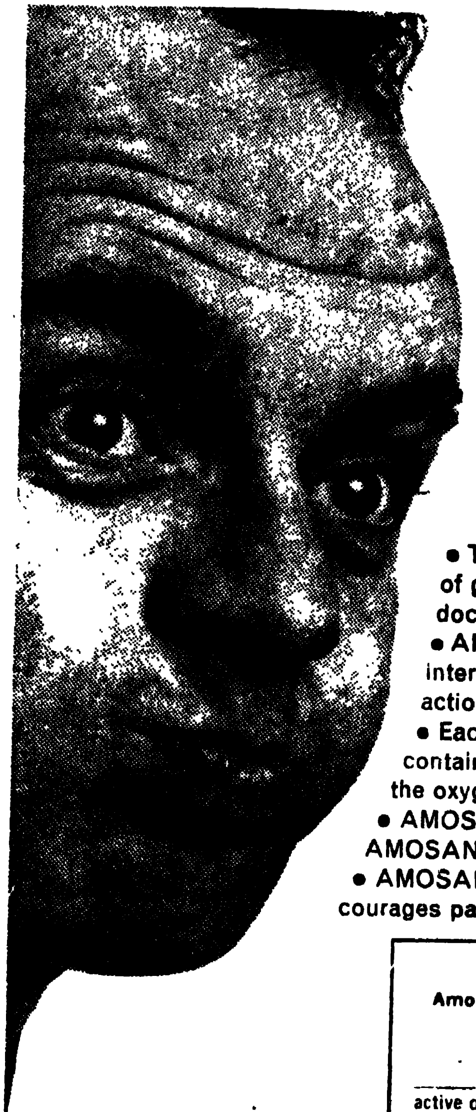

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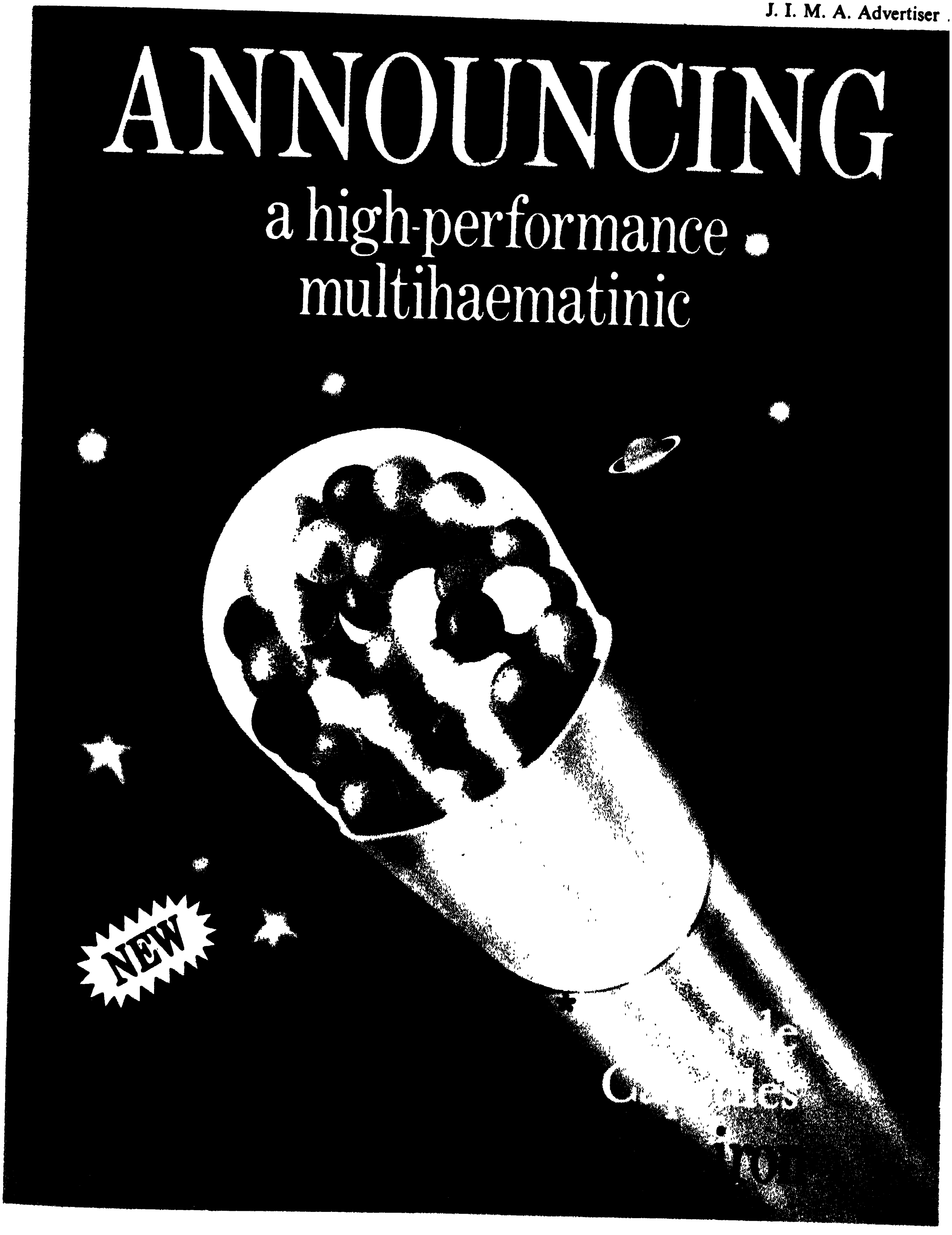
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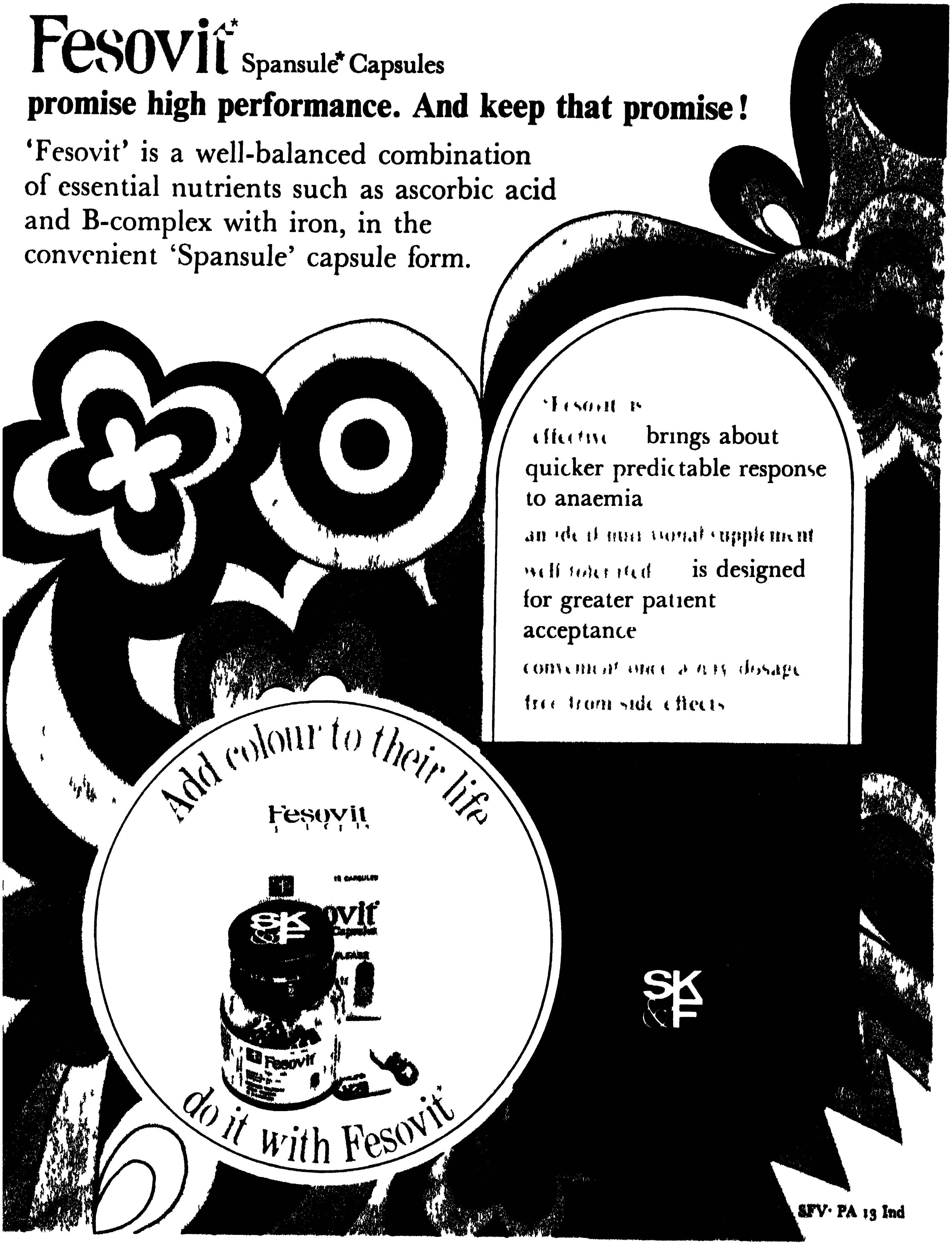

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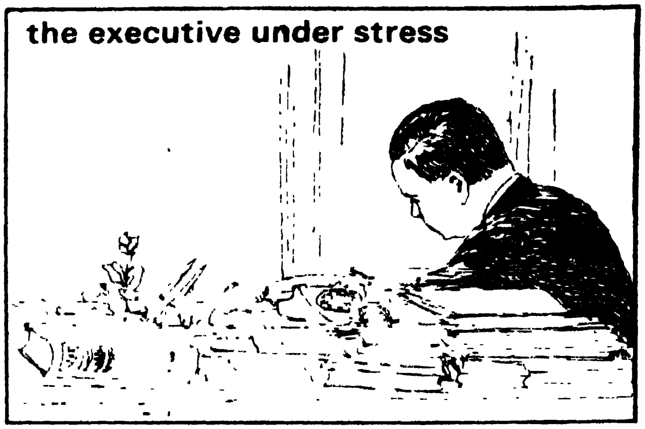
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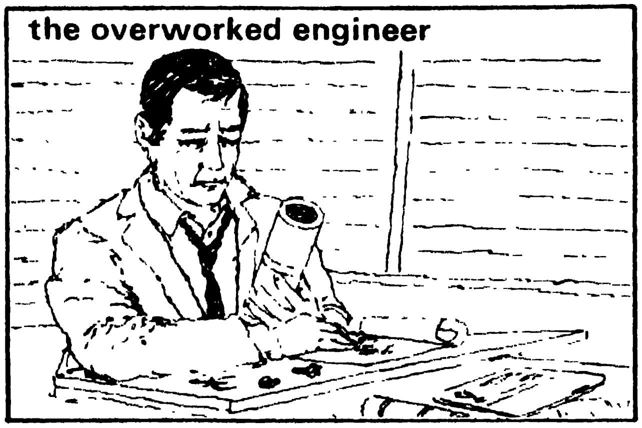
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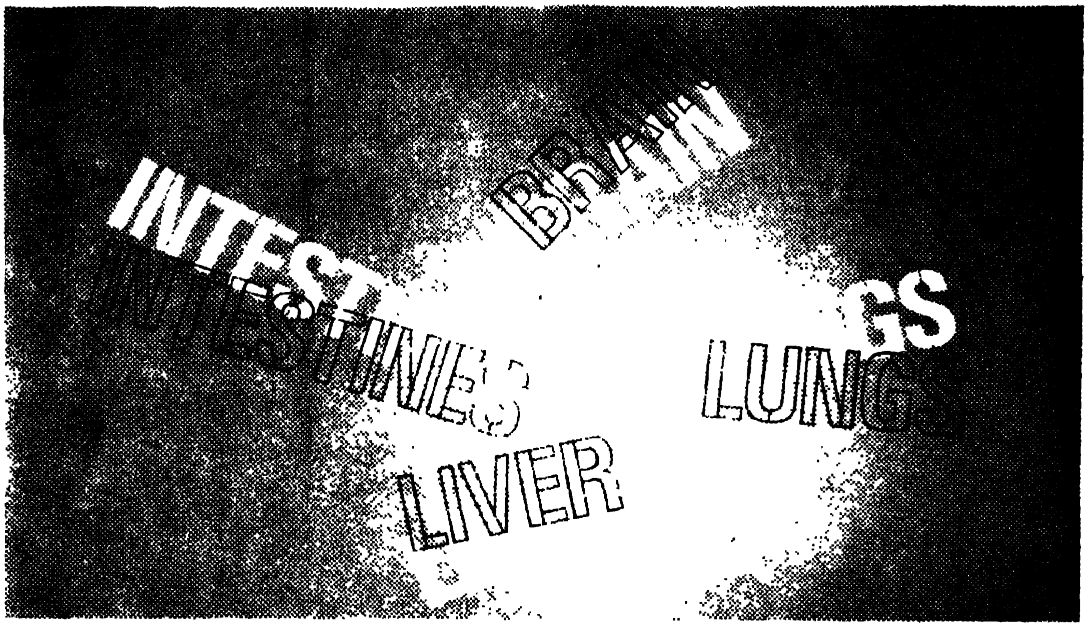

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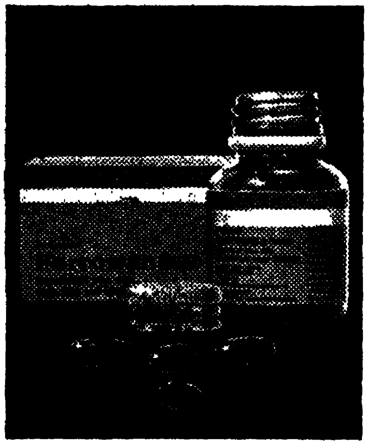

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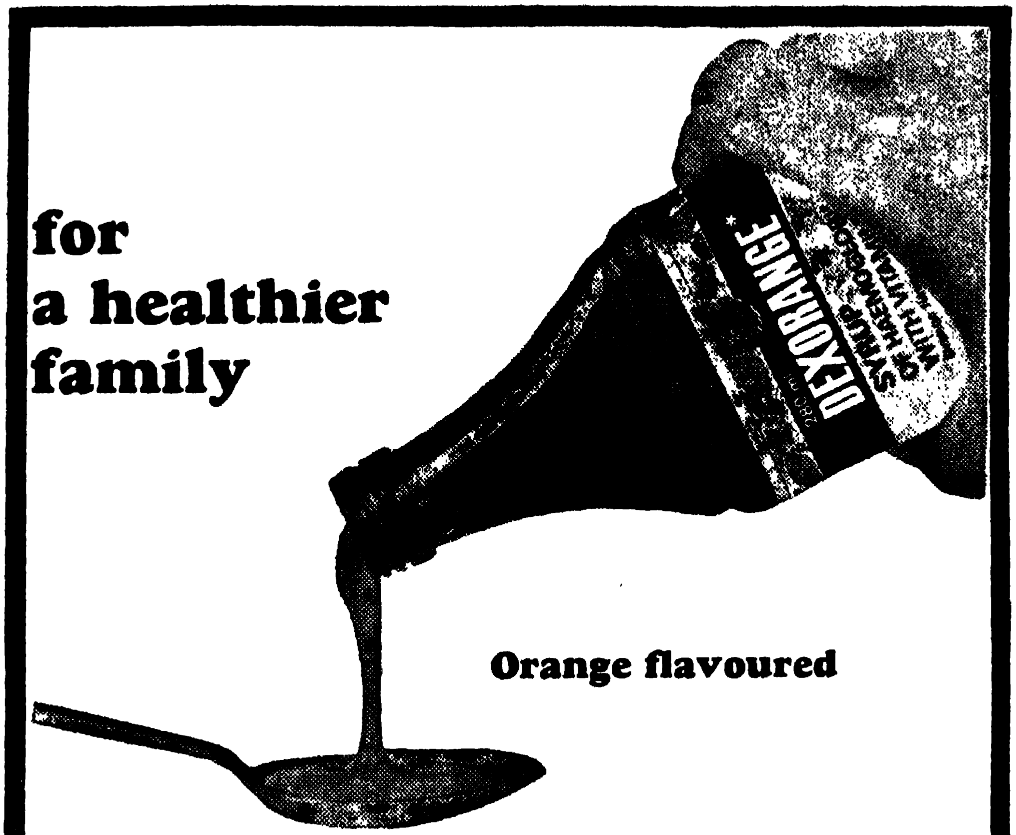

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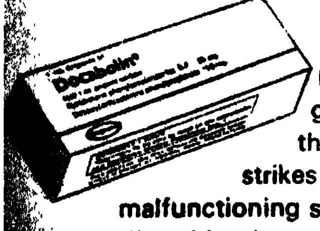

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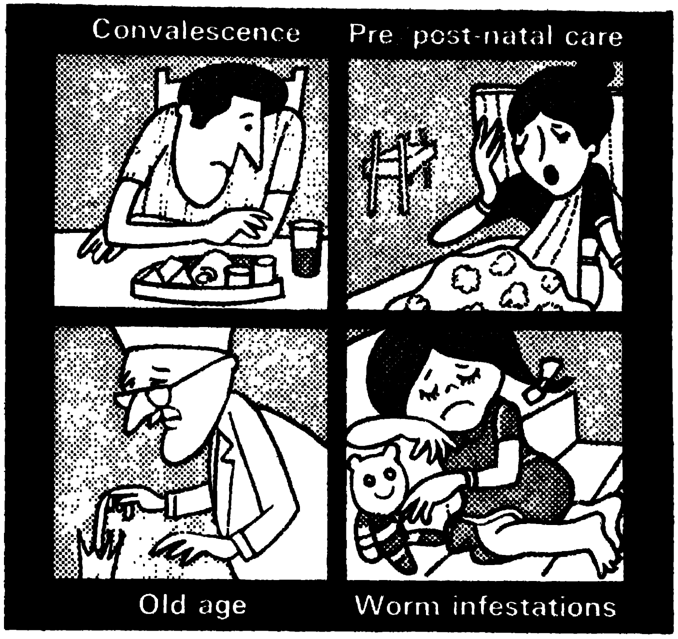

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CALCUTTA
APRIL 1, 1973

ORIGINALS AND PAPERS

1

Rate of Urinary Calcium Excretion Following Intravenous Administration of Calcium as an Indicator of Bone Metabolism

B. N. BALKRISHNA RAO*, T. S. TRIPATHI**

[Received for publication May 22, 1971]

The first half of the twentieth century witnessed the enormous increase in our knowledge of biochemical abnormalities associated with pathological conditions in bones. It was the work of Schilling and Laszlo (1951) that primarily distinguished two groups of cases, the osteoblastic with high retention and the osteoclastic with little or no retention of the injected dose. McCance and Widdowson (cited by Baylor *et al.*, 1950) were of the opinion that intravenously injected calcium is rapidly excreted by the kidneys.

The velocity of exchange is probably related to the finer structural differences between bones, reflecting differences in the degree of vascularisation, in the diameter of trabeculae and the age of Haversian systems in different localities. Age, sex, dietetic intake, ACTH and parathyroid activity are the factors which influence the calcium metabolism. Finding the dearth of literature on the subject, the present work was taken up to establish the values for normal as well as pathological conditions of bones which may prove to be of great help in coming to the diagnosis of physiological status of bones.

MATERIAL AND METHOD

The study was carried out in 50 subjects which consisted of the following groups:

1) Normal subject—males 9, females 6;
2) bone tuberculosis—male 1, females 9;
3) chronic osteomyelitis—males 8, females 2;
4) bone neoplasm—males 5, females nil; and
5) fracture—males 9, female 1.

50 ml. of 10 per cent calcium gluconate containing 446 mg. of calcium was diluted with 500 ml. of 5 per cent dextrose solution. The infusion was started at 8 A.M. and given precisely in four hours. After completion of infusion the patient was given diet at regular intervals.

Three samples of blood were drawn, first sample before starting the infusion, second and third samples 5 minutes and 20 hours after the completion of the infusion. Urine samples were taken from the collections made in different containers labelled A (urine collected before starting I.V. infusion i.e., 8 A.M.), B (urine collected from 8 A.M. to 12 noon), C (urine collected from 12 noon to 4 P.M.), and D (urine collected from 4 P.M. to 8 A.M. of next day). The total volume of urine was noted, so as to calculate the total calcium excretion in 24 hours. The estimation of calcium was carried out by standard method of Clark and Collip (1925).

The study was carried out in detail to see

All India Institute of Medical Sciences, New Delhi
*M.B., F.R.C.S., F.I.C.S., F.A.C.S., Professor and Head of the Department of Surgery
S. S. Medical College, Rewa, M.P.
** M.S., Reader in Surgery

the effect on bone healing in fracture cases, where four such consecutive studies were carried out during the first 48 hours, on 7th day, 14th day and 21st day of fracture (Table 1).

OBSERVATIONS

The results of serum calcium studies are shown in Table 1.

As regards the value of serum calcium in normal individuals much data have accumulated and values are well established, which fairly remains constant within the range of 9.0—11.5 mg. per cent. Similar value is noted in the present study. However, interesting facts brought about by the present study are that if serum calcium level above 12 mg. per cent is considered to be hypercalcaemia, two cases out of five in the series of bone neoplasm and five out of nine in fracture cases revealed hypercalcaemia. In fracture cases it was found only in the study carried out during the first 48 hours of fracture. The maximum value noticed was 13.8 mg. per cent. This hypercalcaemia may be due to greater mobilisation of calcium from bones in osteolytic lesions and from fractured ends of bone.

A significant rise in serum calcium was noticed after intravenous administration of calcium in all cases. The peak level was observed five minutes after completion of the infusion. A rise in serum calcium level from 10.52 to 13.7 mg. per cent was noticed in normal cases. These values were comparatively low for cases of bone tuberculosis, chronic osteomyelitis and in fracture cases when the study was carried out on the 14th and 21st day of fracture. The rise in serum calcium noticed in cases of bone neoplasm and of fracture when the study was carried out during first 48 hours were 11.27 to 14.32 mg. per cent and 11.75 to 15.93 mg. per cent respectively. In cases of chronic osteomyelitis and bone tuberculosis where the average previous figure was comparatively low the rise was less, and on the other hand in cases of bone neoplasm and fracture, where the average previous figure was comparatively high, greater rise in serum calcium level was observed.

Nordin and Fraser (1956) noted a rise in serum calcium from 10.4 to 13.5 mg. per cent in normal patients and from 9.0 to 11.5 mg. per cent in cases of osteomalacia. The serum calcium level had almost invariably returned to the original value twenty hours after the end of infusion.

The serum calcium level returned to normal range at the end of 20 hours after completion of I.V. infusion of calcium. An average of 20 per cent cases of chronic osteomyelitis, bone tuberculosis and bone neoplasm and 55.5 per cent of fracture cases showed the low figure for serum calcium, twenty hours after completion of I. V. infusion, than their original value.

Attempts have been made to establish the values of the rate of urinary calcium excretion after intravenous administration of calcium in 15 normal individuals. The present study shows that there is a gradual increase in urinary calcium level, attaining its maximum during the next four hours followed by a gradual fall during the next 16 hours, but still remaining at a higher level as compared to its initial level (Table 2).

Table 1—*Showing the Results of Serum Calcium Studies (in mg.%)*

Group	Before starting I. V. infusion	5 minutes after completion of I. V. infusion	20 hours after completion of I. V. infusion
1) Normal subject	8.8 - 11.4 10.52	12.2 - 10.2 13.70	9.4 - 12.2 11.04
2) Bone tuberculosis	9.2 - 11.8 10.36	12.6 - 14.4 13.34	9.6 - 13.6 11.06
3) Chronic osteomyelitis	8.8 - 11.8 10.28	11.6 - 13.8 12.88	9.4 - 12.2 10.92
4) Bone neoplasm	9.6 - 12.6 11.27	12.6 - 15.8 14.32	9.8 - 13.2 11.48
5) Fracture:			
i. 1st 48 hours	10.2 - 15.8 11.02	13.2 - 18.6 15.93	10.2 - 13.2 11.71
ii. 7th day	9.2 - 12.2 11.02	12.8 - 15.8 13.94	10.4 - 12.0 11.08
iii. 14th day	9.8 - 11.8 10.76	12.8 - 14.2 13.70	10.4 - 11.6 10.96
iv. 21st day ...	9.2 - 11.2 10.60	12.4 - 14.2 12.94	10.4 - 11.2 10.72

Table 2—*Showing Urinary Calcium Studies after I.V. Infusion of Calcium*

Group	Before starting I. V. infusion	5 minutes after completion of I. V. infusion	4 hours after completion of I. V. infusion	20 hours after completion of I. V. infusion	Total calcium excretion for 24 hours
Normal subject	7.2-13.4 10.92	12.8-21.8 16.70	31.4-56.20 37.92	17.6-35.20 32.62	271.32-542.08 362.49
Bone tuberculosis	5.6-12.6 9.1	13.6-24.20 16.68	12.6-31.20 24.4	5.2-28.2 16.48	101.16-260.60 225.75
Chronic osteomyelitis	5.8-23.6 11.32	11.6-23.4 18.9	19.4-49.2 29.18	10.6-42.8 20.42	185.04-423.76 257.68
Bone neoplasm	7.4-38.6 17.52	18.8-54.2 28.84	36.60-62.8 46.68	21.6-54.6 35.32	265.72-647.56 426.85
Fracture during 1st 48 hours	9.6-23.8 17.17	16.2-52.8 33.6	22.4-76.40 56.15	21.8-58.40 43.42	306.52-826.16 627.57
7th day	9.4-21.4 12.36	17.2-28.8 20.06	36.8-56.60 44.18	22.2-40.4 32.36	358.76-583.16 486.28
14th day	8.6-14.6 11.4	18.6-27.2 20.78	27.6-41.2 36.64	18.8-30.60 24.50	278.96-492.32 367.66
21st day	8.6-15.10 10.2	14.8-18.6 16.46	22.8-31.4 26.66	11.2-19.4 14.68	262.84-320.94 254.12

DISCUSSION

Baylor *et al. (loc. cit.)* studied the rate of urinary calcium excretion in two subjects after giving 550 mg. of calcium in two divided doses in twenty-four hours, for four successive days. They noted a prompt rise in urinary calcium from 162 mg. to 504 mg. in 24 hours. They observed that the maximum excretion was during the first three hours after the administration of calcium in the morning and in the evening. The excretion was high also in the subsequent three hours. After this period the calcium level returned to the initial level or even lower.

Schilling and Laszlo *(loc. cit.)* established the correlation between calcium metabolism following intravenous administration and functional state of skeletal system. They injected intravenously 50 ml. of 10 per cent calcium gluconate containing 446 mg. of calcium. The study was carried out in 20 subjects which included four normal subjects and the rest of the patients with senile osteoporosis, osteomalacia, multiple myeloma and secondary deposits in bones. Renal function, as measured by urea and creatinine function tests, showed no significant change during and after the infusion. From the date obtained they could divide cases into four groups depending upon the urinary calcium excretion for 24 hours, after the start of infusion:

1) Normal subjects and patients with no demonstrable bone lesions—302 mg. ± 24 mg./24 hours. 2) Patients with abnormal tendency towards calcium deposition—50 mg. ± 14 mg./24 hours. 3) Patients with osteolytic bone lesions reflecting on decreased ability to utilise administered calcium—460 mg. ± 92 mg./24 hours. 4) Intermediate in character where rate of calcium excretion was 170 mg. ± 31 mg./24 hours.

This group comprised patients who had bone disease in the phase of repair or greater bone formation.

Bone tuberculosis—The average value obtained for urinary calcium excretion in different samples and the average total calcium excretion were low as compared to that of normal, which is suggestive of a greater tendency towards deposition of calcium. The duration of illness proved to have little or no relation with the rate of calcium excretion in the urine. It is the actual physiological status of the bone which determines the amount of calcium to be excreted in the urine. In the active stage of the disease, whatever its duration, the excretion is more while in the stage of repair the excretion is less. To ascertain the activity of the disease process, the help of serial skiagrams and E.S.R. was taken.

Chronic osteomyelitis—The value obtained was low as compared to that obtained for normal subjects, suggesting a greater tendency towards calcium retention. The value obtained was nearer to that obtained in cases of bone tuberculosis. This is suggestive of the fact that the underlying physiological process in both the groups is the same.

Bone neoplasm—The study was carried out in 5 cases of bone neoplasm. Out of these two were cases of benign neoplasm and the remaining three were of secondary bone lesions, osteolytic in nature as shown by roentgenographic studies. The excretion of calcium was high in cases of malignant bone tumours with osteolytic lesions in comparison to normal and benign bone tumours. The value obtained by Schilling and Laszlo *(loc. cit.)* for patients with osteolytic bone lessions was 469 ± 92 mg./24 hours.

Bone fracture—The study was carried out in 10 patients with bone fracture during first 48 hours of the fracture and 7th, 14th and 21st day of fracture.

The present study reveals that following fracture there was an increased excretion of calcium in the urine. The higher values were obtained in the study carried out during first 48 hours of the fracture. Thereafter, the gradual fall in calcium excretion in the urine was noticed in the studies carried out on 7th, 14th and 21st day of fracture. The greater the initial level of calcium in the urine, greater was the rise observed in calcium excretion after I.V. administration. There was little or no retention of injected calcium during the first 48 hours of the fracture. The retention of calcium gradually increased and was found to be maximum on the 21st day and is probably related with bone repair.

The present study demarcates two groups of cases i.e., one with osteolytic bone lesions with little or no tendency towards calcium retention and the other with osteoblastic bone lesions with greater tendency towards calcium retention and it depends upon the "avidity" of skeleton for calcium. If it is so, the value of above procedure should be extended to routine diagnostic investigation in evaluating the metabolic process of bones in different diseases.

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2

Protective Effect of Cyproheptadine and BC 105 Against the Lethal Effects of Exudates from Rat Burnt Skin

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Rocha e Silva and Rosenthal (1961) have reported that the exudates from the burnt rat skin contain histamine, bradykinin, adenosine derivatives and possibly serotonin and some other yet unidentified pharmacologically active and toxic substances. In the present communication, an attempt has been made to see if the antihistaminics, cyproheptadine and BC 105 (4-(1 methylpiperdylinene-4)-9, 10-dihydro-4H-benzo (4,5) cyclohepta (1,2-b) thiophene maleate), have got any protective effect against the toxicity of the exudate.

MATERIAL AND METHOD

The method of Rocha e Silva and Rosenthal *(loc. cit.)* was followed to obtain the exudates. Albino rats weighing between 100 and 150 g. were anaesthetised with nembutal sodium (30 mg./kg.) and then 30 ml. of air were injected beneath the dorsal skin, to raise a pouch of 7×4×3 cm. The dome of the pocket was submerged in water at 95°C for 15 to 20 seconds. After scalding, the animal was suspended by its paws and 5 ml. of Tyrode's solution were injected into the pouch. The animal was then shaken for 2 minutes after which the fluid was removed by syringe and needle. This was the exudate. The washing was repeated at regular intervals after burning. A maximum of 5 washings of 5 ml. each were done to each animal.

The exudate, obtained by the above technique, was injected intraperitoneally into albino rats taken in groups of ten and the percentage mortality at three different dose levels was found out during the next 24 hours. The results were taken as control readings.

Cyproheptadine and BC 105 were injected intraperitoneally in different doses one hour before administration of the exudate in a dose of 5 ml. per 100 g. of body weight to each rat and at least three dose levels between 0 and 100 per cent mortality were determined for each drug.

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RESULTS

Table 1 shows the percentage mortality of rats when three different doses of the exudate were administered. A dose of 7.5 ml. per 100 g. of body weight was found to produce 100 per cent mortality.

Table 1.—*Showing the Percentage Mortality of Rats when Injected with Exudate from Rat Burnt Skin*

Control dose of the exudate (ml./100 g. of body weight)	No. of animals	Percentage mortality in 24 hours
2.5	10	40
5.0	10	70
7.5	10	100

The percentage mortality was significantly reduced by both cyproheptadine and BC 105. the latter drug being more potent in this respect (Table 2).

Table 2.—*Showing the Percentage Mortality of Rats when Injected with Exudate (5 ml./100 g. of Body Weight) an Hour after Administration of the Test Drugs*

Drug	Dose mg./100 g.	No. of animals	Percentage mortality in 24 hours
Cyproheptadine	0.50	10	60
	1.00	10	40
	2.50	10	10
BC 105	0.25	10	50
	0.50	10	20
	0.75	10	0

DISCUSSION

The exudate obtained from the pouch after scalding was found to contain histamine, bradykinin, adenosine derivatives and possibly other unknown toxic substances which contribute to the death of the animals (Rosenthel *et al.*, 1956). Cyproheptadine is known for its powerful antihistaminic and antiserotonin properties (Stone *et al.*, 1961). BC 105 is being developed as an antihistaminic and antiserotonin compound (Cerletti, 1969). The fact that these compounds decreased the percentage mortality of the animals due to the lethal effect of the exudate from burnt rat skin may be significant. It may, therefore, be anticipated that the histamine and serotonin contents of the exudate are the major cause of death in animals and the two compounds protect the animals due to their antihistaminic and antiserotonin properties only.

Stone *et al.* (*loc. cit.*) after extensive toxicological studies of cyproheptadine stated that this drug has a good margin of safety. In acute toxicity studies, 13.9 mg./kg. of cyproheptadine produced no toxic effect or death and the L.D. 50 of BC 105 in mouse, rat and rabbit is 43, 17 and 19 mg./kg. I.V. respectively. In clinical cases of extensive burns, antihistaminics are rarely used. Antihistaminics are, therefore, possibly therapeutically important in the management of cases of extensive burns.

When the results of the toxicity studies of cyproheptadine and BC 105, and their protective effects against the exudates from burnt rat skin are analysed, it becomes evident that on the basis of efficacy, potency and safety, these compounds show sufficient promise to warrant further experimental and clinical trials in clinical cases of extensive burns.

SUMMARY

Two antihistaminic and antiserotonin compounds, cyproheptadine and BC 105, have been tested for their protective effect against mortality due to the exudates from rat burnt skin.

It has been observed that both the compounds have a significant protective action by decreasing the percentage of mortality.

The significance of these findings and the possible therapeutic importance of two potent antihistaminic and antiserotonin drugs in clinical cases of extensive burns have been discussed.

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3

Injury Incidence Among *Kabaddi* Players During the Two All-India Level Tournaments

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This investigation had been undertaken to find out the causes, types, and body distribution of injuries among the *kabaddi* players during tournaments. It was hypothesised that the *kabaddi* players are more susceptible to the injuries as compared to other games because of greater chances of body and ground contact in the game situations like catching, raiding, pushing, etc. The lack of scientific evidence into the real nature and severity of *kabaddi* injuries has resulted in negligence of preventive and curative aspects of these injuries. During the present study period, it was also pointed out that the lack of special medical care of the injured *kabaddi* players had either caused the permanent deformity of the neglected injured body part or decreased the work efficiency. With this background in view the present investigation had been carried out to study the causes, types and body locations of the injuries among *kabaddi* players.

METHOD

The record of injury incidence was kept throughout the period of two all-India level tournaments. The tournaments were organised by the local clubs, each at Amravati and Nagpur, where 32 renowned clubs including 9 from Maharashtra participated as shown in Table 1. During these two tournaments a total 100 matches were played and observed for injury incidence involving the total participation of 224 players. The special individual record sheets were prepared in advance having the columns for filling up the information related to every injury incidence regarding the game situation in which the injury occurred, type of injury, its body location and the specific major cause like the body or the ground. These record sheets were maintained for every individual injured player throughout the tournaments.

In the present investigation the diagnosis of the injury was authenticated in consultation with the available medical officials of the organising committee. The injury incidence record, thus collected, was tabulated and analysed for the present study.

OBSERVATIONS

Incidence—Analysis of the injury incidence has shown that out of 224 players, 67 per cent suffered due to one or more injuries. This percentage is of considerable significance and needs immediate attention to minimise it.

According to Table 2, among the injured players, 64 per cent suffered from at least one injury while 25 per cent from two, 9 per cent from three and 2 per cent from four injuries. The results indicate that significant percentage of players was susceptible to injuries in *kabaddi* and therefore this requires consideration for prevention and cure.

Causes of injuries—Major causes of injuries with the game situations are given in Table 3.

Table 3—A indicates that the ground was the cause of 37 per cent of the total injuries during struggle (struggle starts when the raider touches the defenders or antiscian in the opponent's court), 36 per cent while catching the raider and 5 per cent during push. Thus Table 3-B concludes that 78 per cent of the injuries was caused due to the ground, either because of fall or its condition. Players caused 22 per cent of the injuries which occurred either due to rough play (rough handling) or body contact. Table 3-C reveals that nearly equal percentage of injuries, 47 per cent and 45 per cent occurred during game situation of catching in defence and during struggle while raiding, respectively.

Types of injuries and their causes—Table 4 shows the types of injuries which occurred during the present investigation with their percentage of incidence and Table 5 presents the causes of the injuries with the game situation in which they occurred.

Abrasions are wounds in which the surface epitheleum of the skin or mucous membrane is eroded. Table 4 indicates that 64 per cent of the total injuries were abrasions. It was observed that in the majority of such cases, this type of injury was of a minor nature. These abrasions resulted from sliding or dragging on the ground while "catching" or during "struggle" or during "push". Table 5 denotes that 50 per cent of the total abrasions occurred during "struggle" to the raiders and 45.5 per cent to the defenders while "catching". Comparatively, abrasion incidences were found to be very low during "push", e.g., 4.5 per cent.

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Table 1—*Showing the Total Number of Active Participants in Two All-India Level Tournaments of* Kabaddi *and Their Statewise Classification*

Maharashtra	M.P.	Mysore	Orissa	Rajasthan	Gujarat	Delhi	Total
161	21	14	7	7	7	7	224

Table 2—*Showing the Incidence of Players Suffering from Injuries in Two All-India Level Tournaments*

No. of players involved	No. of players who suffered due to injury	No. of players who suffered due to			
		One injury	Two injuries	Three injuries	Four injuries
	%	%	%	%	%
224	67	64	25	9	2

Table 3—*Showing the Incidence of Causes of Injuries and Games Situations*

Table 3 — A Causes in relation to games situations	(%)
Ground, while catching (in defence)	36
Player, while catching (in defence)	11
Ground, during push	5
Player, during push	3
Ground, during struggle (while raiding)	37
Player, during struggle (while raiding)	8

Table 3 — B Major causes	(%)
Ground	78
Players	22

Table 3 — C Injuries occurred during the situation	(%)
While catching	47
During struggle	45
During push to raider	4.5
During push to defender	3.5

Table 4—*Showing Types of Injuries Observed among Sixty-seven per cent of Injured Players in Two All-India Level Tournaments of* Kabaddi

Abrasions	Sprains	Contusions	Lacerations	Strains	Penetrating injuries	Crushing	Watering of eyes	Dislocation
%	%	%	%	%	%	%	%	%
64	16	10.5	6	1	1	0.5	0.5	0.5

Table 5—*Showing Causes in Relation to Game Situation of the Injuries among Sixty-Seven per cent Injured Players in Two All-India Level Tournaments of* Kabaddi

Types of injury	While catching		During struggle		During push	
	Ground	Player	Ground	Player	Ground	Player
Abrasions	45.5	—	50.0	—	4.5	—
Sprains	24.0*	34.0	10.0*	26.0	3.0*	3.0
Contusions	15.5	31.0	11.5	23.0	—	19.0
Lacerations	21.5	7.5	36.0	7.0	28.5	—
Strains	—	50.0	—	50.0	—	—
Other injuries	20.0	40.0	—	40.0	—	—

*Ground as a cause of sprain should be meant here as a sprain due to body weight of the player himself in contact with ground

Sprain is an injury to a joint or its immediate neighbouring structures in which the joint motion has been taken beyond its physiological limits without dislocation or subluxation. Next to abrasions were the incidence of sprains which were noted to be 16 per cent of all the injuries and found to be of a serious nature. Table 5 points out that the major cause of sprain was the body weights of the other players while "catching", or during "struggle" or during "push". Sprains were the result either from the body weights of the other players on the joint or the forceful pressure of the player himself on the joint or the wrong hold by the other player, causing forcible wrenching of the joint. The players caused 34 per cent and 26 per cent of the sprains while "catching" and during "struggle" respectively. Broad analysis of the causes of sprain showed that 63 per cent of the sprains was caused due to other players and 37 per cent due to pressure of the player himself in uncontrolled position in contact with ground. Lack of proper medical care in many cases resulted in permanent flexion deformity causing anterior or lateral angulation of the fingers.

Contusion is a subcutaneous injury resulting from a blow where the skin sustains very little or no break. In the present investigation, 10.5 per cent of the total injuries were contusions resulting from the contact of the ground or the body. Many of these contusions were observed to be of a severe nature. Table 5 indicates that more than 70 per cent of the total contusions were caused from body contact of the players. The defenders were observed to be more susceptible to contusion while "catching" (31 per cent) than raiders (23 per cent) from the body contact. Ground contact also caused contusions to the extent of 27 per cent of the total causes while "catching" and during "struggle". It should be noted here that during "push", all the contusions were due to 'player contact' and not a single one due to the ground. During the present investigation it was specifically observed that the lack of proper and timely medical care of contusions resulted in permanent haematoma formation of finger joints of hands or toes.

Laceration is an irregularly torn wound. According to Table 4, 6 per cent of the injuries were lacerations and Table 5 shows that in all games situation, the main cause of lacerations was the ground.

Strain is a condition in which muscles, fascia, ligaments and tendons are damaged but not torn when subjected to the stress of uncoordinated action. The incidence of strain was observed to be 1 per cent of all the injuries.

Table 4 shows the incidence (percentage) of penetrating injury, crushing injury, watering of eye and dislocation which was only 0.5 per cent in each case. Because of the small percentage of these injuries, they have been included under the heading of other injuries in Table 5. According to Table 5, 60 per cent of these injuries occurred during "catching" to the defenders due to players 40 per cent and 40 per cent occurred during "struggle" to the raiders due to defenders.

Sites—Broad classification of the body distribution of injuries is presented in Table 6. The lower extremities were found to be most commonly injured compared to the upper extremities, head or trunk (Table 6). More than 60 per cent of the injuries occurred to lower extremities involving mainly the knee, toe, and ankle.

Table 6—*Showing Body Distribution of the Injuries among Sixty-Seven per cent Injured Players in Two All-India Level Tournaments of* Kabaddi

Injuries to head %	Injuries to upper extremities %	Injuries to trunk %	Injuries to lower extremities %
6	30	2.5	61.5

The incidence of the type of injuries to head, upper extremities, trunk and lower extremities is shown in Table 7.

Table 7—*Showing Body Distributian of the Various Types of Injuries Among Sixty-Seven per cent Injured Players in Two All-India Level Tournaments of* Kabaddi

Body distribution of injuries	Head %	Upper extremity %	Trunk %	Lower extremity %
Abrasions	14.5	73.0	—	68.0
Sprains	—	22.5	—	15.0
Contusions	50.0	—	100.0	9.0
Strains	—	1.0	—	0.5
Lacerations	14.5	2.5	—	7.0
Crushing	7.0	—	—	—
Watering of eye	7.0	—	—	—
Penetrating	7.0	—	—	0.5
Dislocation	—	1.0	—	—

Abrasion was found to be the most common injury to upper (73 per cent) and lower extremities (68 per cent), involving mainly the elbow and knee respectively.

Next to abrasion, the common injury to upper (22.5 per cent) and lower extremities (15 per cent) was sprain. The trunk was found to be absolutely free from all injuries except contusion. It should be noted here that the trunk was susceptible only to contusion involving the abdomen and chest. Further, most of the trunk injuries occurred during "push" due to body contact (Table 8). Contusion was also a major injury to the head causing 50 per cent of the injuries. Upper extremities were found to be free from contusions.

Lacerations were more common to the head and then the lower extremity and upper extremity. Other types of injuries were observed to the head only, while dislocation occurred to the shoulder joint only. Body distribution of injuries and the causes in relation to game situation are shown in Table 8.

Table 8 enumerates the causes of injuries to different parts of the body and situations during which the incidence occurred. Approximately, more than three-fourths of the head injuries were due to body contact while "catching" and during "struggle". Upper extremities suffered mostly from ground injuries to the extent of 80 per cent, equally to the defenders while "catching" and to the raiders during "struggle".

Table 8—*Showing Body Distribution of Injuries and the Causes in Relation to Game Situations*

Body distribution and game situations	Head %	Upper extremity %	Trunk %	Lower extremity %
Ground while catching	13.0	41.0	—	38.0
Player while catching	40.0	8.0	17.0	8.0
Ground during struggle	7.0	42.0	—	39.0
Player during struggle	33.0	6.0	17.0	7.0
Ground during push	—	3.0	—	7.0
Player during push	7.0	—	66.0	1.0

All the trunk injuries were due to player contact and 66 per cent of these occurred during "push". The ground was found to be the main cause of injuries to the lower extremities. From Table 8 it should be noted that the head and trunk injuries were mainly due to body contact, while injuries to upper and lower extremities were due to the 'ground', either in the process of "catching" or during "struggle". During "push", trunk injury was most common.

SUMMARY AND CONCLUSIONS

The two all-India level *kabaddi* tournaments were observed for injury incidence in which a total 100 matches were played and 224 players participated actively. The injury incidence record was maintained on specially developed individual injury incidence record sheets.

During tournaments, 67 per cent of the total participants suffered injuries. Among the injured players, 36 per cent suffered multiple injuries. Thus, *kabaddi* was found to be in need of special consideration to minimise the injury incidences.

'Ground' was found to be the major cause (78 per cent) of injuries. The defenders and raiders suffered equally during all games situations.

The most common injuries were abrasions (64 per cent) followed by sprains (16 per cent), contusions (10.5 per cent), lacerations (6 per cent) strain (1 per cent), and penetrating injury (1 per cent). The incidence of injuries like dislocation (0.5 per cent), watering of eyes (0.5 per cent) and crushing (0.5 per cent) was found to be very low.

The chief cause of abrasion was the sliding or dragging on the ground while "catching" or during "struggle". Sprain was mainly due to body weight of the players (65 per cent). Major cause of contusion was the body contact (70 per cent). In many cases lack of timely and proper medical care of sprain and contusion resulted in permanent flexion deformity or haematoma formation of finger joints.

Most of the injuries were to the lower extremities (61 per cent) than to the upper extremities (30 per cent), head (6 per cent) or trunk (2 per cent).

Abrasion was the most common injury to upper extremities (73 per cent) and lower extremities (68 per cent). Contusion was observed to be the major injury to the trunk (100 per cent) and head (50 per cent). The trunk was found to be absolutely free from all injuries other than contusion.

Head and trunk injuries in *kabaddi* were mainly due to forcible body contact. The injuries (86 per cent) to upper extremities and (84 per cent) to lower extremities were either due to ground contact or ground conditions.

4

Psychiatric Emergencies in General Hospital

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Psychiatric emergency is defined as acute disorder which if unattended will lead to grievous injury or death of the patient or to others.

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With the introduction of community psychiatry, increasing number of patients are visiting psychiatric centres with emergencies. Burden of management of such patients falls both on general practitioners as well as consultant psychiatrists. Smooth handling of these emergencies is important, as slight negligence may lead to grave consequences. In medical emergencies threat is to the patient but in psychiatric emergencies, it is both to the patient and his relatives.

MATERIAL AND METHOD

This paper is based on our experiences regarding study and management of one hundred cases of psychiatric emergencies. All the cases were admitted as voluntary boarders. Wards are open ones and attendants are allowed to stay with the patients, thus their co-operation and helping hands are available in managing the patients.

Immobilisation of patients in any form is discouraged. In exceptional cases separate cells are used for uncontrolled patients.

After the case is fully evaluated by psychiatrist and necessary investigations made, active therapy is started immediately.

Incidence—During the period of present study (one year) 1779 patients attended the psychiatric department of this hospital. Out of 413 patients who required admission, 100 patients were labelled as psychiatric emergencies. Thus incidence of psychiatric emergencies comes to be 0.6 per cent.

OBSERVATIONS

Age group—Seventy-five per cent of the patients clustered around age group 10 to 39 years. Only 4 patients were over 60 years of age. Children below 10 years were not seen (Table 1).

Excitement was the commonest diagnostic category in the age group of 10 to 39 years followed by conversion reaction (Table 1). Agitated depression was a common emergency over 40 years of age.

Sex ratio—In the present study there were 55 males and 45 females. Males were predominant in the age groups of 20 to 29 and 40 to 49 years, while females were more in the age group of 50 to 59 years.

Marital status—As regards marital status 73 per cent were married compared with 27 per cent unmarried. Among unmarried patients there was predominance of male over female (19 : 6) while the ratio of two sexes is same among married population (Table 2). Excitement was the commonest emergency among both married and unmarried patients. While cases of suicidal attempt, homicide, agitated depression, conversion reaction (hysteria) were more frequent among the married patients.

Referal—As regard the referal, 60 per cent of the patients were brought by relatives and friends. General practitioners referred 20 per cent of cases. Most of the psychotic patients were either brought by relatives or referred by medical men while neurotics were commonly referred by attending doctors.

Table 1—*Showing Age Group and Diagnostic Categories*

Age group (in years)	Excitement			Homicidal	Suicidal	Stupor	Agitated depression	Status epilepticus	Hysteria	Total per cent
	Schiz.	Manic	Others							
10 to 19	6	5	5	—	—	—	—	—	5	21
20 to 29	14	7	—	1	2	2	—	—	3	29
30 to 39	11	6	—	3	2	1	—	1	1	25
40 to 49	3	—	—	2	1	—	3	—	—	9
50 to 59	—	3	—	—	2	—	6	—	1	12
60 to 69	—	—	—	—	1	—	3	—	—	4
Total	34	21	5	6	8	3	12	1	10	100

Table 2—*Showing the Marital Status and Diagnostic Categories*

Marital status	Excitement			Homicidal	Suicidal	Stupor	Agitation	Status epilepticus	Hysteria
	Schiz.	Manic	Others						
Married									
Male	9	10	—	5	4	1	5	1	1
Female	13	7	1	1	3	—	7	—	7
Unmarried									
Male	8	4	3	—	1	2	—	—	1
Female	4	—	1	—	—	—	—	—	1
Total	34	21	5	6	8	3	12	1	10

Diagnostic categories :

Excitement was the commonest psychiatric emergency (60 per cent) followed by agitated depression (12 per cent) and hysteria (10 per cent). Only 8 (8 per cent) patients were brought for suicidal attempts ; 6 per cent were homicidal and 3 per cent stupor. Status epilepticus was the least common psychiatric emergency in our study (1 per cent).

Recovery and duration of stay :

In present study 66 per cent cases showed complete remission while 28 per cent had partial remission in their symptoms. Majority of the patients (55 per cent) required 2-4 weeks stay in the hospital. Only 18 per cent patients were kept for duration exceeding four weeks. When comparison is made between duration of stay and degree of recovery, 2-4 week's period was most beneficial, as this resulted in 52 per cent remission and only 5 per cent relapse (Table 3). Chances of relapse and partial remission were increased when stay was shortened to less than 2 weeks.

MANAGEMENT

Drug therapy alone was given in 12 per cent of cases and 80 per cent were treated both by drugs and electroconvulsive therapy (ECT). Insulin coma therapy was used in 8 per cent of cases in addition to drugs and ECT. Soluble insulin was only used. It was gradually increased from 10 units, till patient developed coma. Dose varied from 80-800 units (40-60 coma hours are required for recovery). Narcotherapy was given to 8 (8 per cent) neurotic patients. Hypnosis was done in 2 (2 per cent) patients of hysteria (conversion reaction).

Mode of discharge :

Ninety-two per cent of cases were discharged voluntarily. Out of these, three patients were referred to various other departments for their physical ailments. One (1 per cent) case was referred to mental hospital.

Abscondance :

During the course of present study 5 (5 per cent) cases absconded of which 4 were males. All the cases were later on traced and therapy was completed.

Two (2 per cent) deaths occurred in present study and both were due to associated physical diseases like congestive heart failure and haematemesis, etc.

Relapse :

All cases were followed and fortnightly progress report was maintained. In this study 14 cases showed relapse in their symptoms. Among them 10 were schizophrenics, 2 manic depressive psychoses, 1 agitated depression and 1 was case of hysteria. After appropriate therapy given in each case, no further relapse was seen.

DISCUSSION

Lower incidence of psychiatric emergencies in present study was due to the facts that large number of patients do not consult any doctor, many are suspicious and have an unhealthy attitude towards mental institutions and its inmates, and lastly people living at distant places have no knowledge about the existence of this centre.

Though no age group is exempted from psychiatric emergencies, certain age periods such as adolescence, early adulthood and involutional are more vulnerable to these emergencies. Age distribution reported by various centres showed wide range with clustering around mid-thirty. Errera *et al.* (1963) gave 37.7 years median age for male and 34.9 years for female in their studies.

The rapid increase of psychoses in adolescence and early adulthood is due to multiple problems which youngsters have to face such as integration of sex with personality pattern, social and employment problems and those of emancipation from parents. The involutional period also brings an increase in mental disorders due in part to declining activities of endocrines, reproductive glands and other organs but more often to the frustration, threat and other problems which the patients then meet.

Table 3—*Showing the Relationship Between Duration of Stay, Percentage of Patients, Degree of Recovery, Relapse, Abscondance*

Duration of stay (in weeks)	Percentage of patients	Complete remission	Moderate remission	No improvement	Relapse	Abscondance
1 to 2	27	12	15	5	7	4
2 to 4	55	42	10	1	5	1
4 to 8	8	4	1	—	—	—
8 or more	10	8	2	—	2	—
Total		66	28	6	14	5

In this study male patients were more as compared to female. However, when unmarried patients were excluded (19 males and 8 females) ratio was equally distributed between the two sexes. In this part of country female patients are only brought for treatment when they become unmanagable and start breaking social norms. Analysis of data from mental hospitals shows the admission ratio as 6 men to 5 women. Our psychiatric centre functions as a miniature mental hospital from practical point of view and thus explains the male predominance. Errera *et al. (loc. cit.)* have reported in their study that males are sent to psychiatric hospitals while females are referred to psychiatric O.P.D. This factor also influences the sex ratio in this study.

Predominance of married patients in present study is probably as the result of multiple problems which these people have to face such as sexual and marital adjustment, child bearing, pregnancy and large family.

Predominance of psychotic patients in the present study was due to easily understandable behaviour of psychotic patients by relatives and referring doctors, thus they were brought immediately to the nearest psychiatric centre.

Ideal period of stay noticed in present study was 2-4 weeks where number of cases showing complete remission were maximum and relapses scanty. Patients were kept in hospital till their acute symptoms subsided. They were encouraged to complete therapy in the O.P.D. This helped in preventing overcrowding and maintaining patient's enthusiasm for early recovery. Problems of rehabilitation and institutionalisation are also minimised in this way.

Electroconvulsive therapy and drugs proved to be most useful in our cases. Errera *et al.* (*loc. cit.*) in their paper on psychiatric emergencies have stressed about the importance of integrated approach. "All modalities must be used in a flexible manner. Every case must be individualised and physicians must be in a position to offer immediately any treatment modality that is appropriate and helpful".

SUMMARY

Experiences regarding study of one hundred cases of psychiatric emergencies at psychiatric centre of J. L. N. Hospital, Ajmer (Rajasthan) have been discussed.

All the cases were admitted as voluntary boarders. Excitement was the commonest emergency seen. Eighty per cent cases were managed by drugs combined with ECT. Complete remission was seen in 60 per cent cases.

ACKNOWLEDGMENT

We are thankful to Dr. M. N. Kathju, Principal and Controller of Jawahar Lal Nehru Medical College and Associated Group of Hospitals, Ajmer (Rajasthan) for his kind permission to use the Hospital records and to publish this paper.

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5

Acute Obstructive Suppurative Cholangitis

A Review of 26 Cases

SALIL KUMAR MUKHERJEE*

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Acute obstructive suppurative cholangitis is usually a complication of calculus disease of biliary tract.

MATERIAL

Twenty-six cases of acute obstructive suppurative cholangitis were treated in B. S. Medical College and Hospital during the period between January 1969 and March 1971. None of these patients had previous operation on biliary tract.

Age incidence—Age incidence is shown in Table 1.

In this series there were 15 females and 11 males.

History and symptoms are shown in Table 2.

Presenting features, radiographic and laboratory findings are shown in Table 3.

MANAGEMENT

Twenty cases had initial intensive conservative treatment with satisfactory response. Elective operation was performed subsequently following complete recovery in 12 and relapse in 8.

There was poor or no response with conservative treatment in 5 cases. Emergency operation had to be undertaken within 48 hours after admission with 2 deaths.

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Table 1—*Showing Age Incidence*

Age (in years)	No. of cases
30-40	1
41-50	12
51-60	12
61-66	1

Table 2—*Showing Symptoms of Disease of Gall Bladder and Biliary Tract in 26 Cases*

Nature of symptoms	No. of cases	Percentage
Vague upper abdominal discomfort, belching, erructation and nausea—duration 2 years	5	19.2
Biliary colic without jaundice	10	38.4
Biliary colic, fluctuating jaundice and fever—duration 3 months	8	30.7
No previous symptoms	3	10.7

In 1 case there was considerable diagnostic dilemma because of unusual clinical features and controversial laboratory data. Operation was deferred as it was thought to be a case of toxic or infective hepatitis. The patient died on the 7th day after admission. Autopsy report showed presence of stones and pus in the biliary tree and gall bladder with abscesses in the liver. Histology of liver demonstrated necrotic changes in liver tissue with extravasation of bile in the liver parenchyma. Kidney tissue showed acute tubular necrosis.

Of these 26 cases there were 3 deaths (11.5 per cent) of which 2 were postoperative (7.6 per cent).

Conservative treatment—Correction of fluid and electrolyte balance, administration of vitamin K, transfusion of fresh blood to those patients who had elevated prothombin time and not responding in a satisfactory way to vitamin K therapy and use of chloramphenicol were the main basis. Mannitol was given intravenously in each case before and during operation to promote diuresis and thereby to prevent acute renal failure, a fatal postoperative complication among these patients.

Hydrocortisone was used in those cases with endotoxic shock who were refractory to other resuscitative measures.

Repeated assessment of the patients was carried out during the whole course of intensive conservative treatment by clinical, haematological and biochemical methods.

Operative procedures—Decompression of biliary tract was performed in all cases through the supraduodenal part of common bile duct. Following evacuation of pus and stones from the biliary tree sphincter of Oddi was dilated and a T tube drainage was inserted in the common bile duct. In all cases the bile duct was grossly dilated, wall was thick with thin walled blood vessels crossing over it. Pus was greenish yellow, stones were soft and oval embeded in biliary mud.

Cholecystectomy was performed in 24 cases after adequate decompression of biliary tree. Gall bladder was shrunken and fibrosed in 14 cases with stones in 10 cases and without stones in 4 cases and acutely inflamed in 11 cases containing both stones and pus.

Cholecystostomy was done in one case as the patient was in moribund condition and cholecystostomy was becoming technically difficult due to cementing inflammatory adhesions.

Cystic duct was widely enlarged and short in all cases. In two cases it so happened that there was practically no cystic duct and gall bladder was opening directly in the biliary tract. Pus in the gall bladder maintained the same character as that of in the biliary tract. Stones were usually multiple and faceted. In two cases there were cholesterol solitaire.

Liver was enlarged and congested in 17 cases with adhesion along the under surface of diaphargm in 5 cases. Biliary cirrhosis was present in 4 cases and in 4 cases the liver was normal. Abscesses were not detected in the liver in any patient.

Head of the pancreas was enlarged and indurated in 4 cases who had impacted stones in the lower end of common bile duct.

Oxidised bile salts was given orally during the postoperative period. T tube drainage was maintained till the colour and viscosity of bile returned to normal.

T tube was removed in an average between 14 and 16 postoperative days after postoperative cholangiogram.

Postoperative complications—Commonest complication of wound sepsis was recorded in 22 cases. All had complete recovery after evacuation of pus and use of antibiotics. 18 patients had postoperative ileus and responded well with nasogastric suction and intravenous fluid and electrolyte. 6 patients had bronchopneumonia and all had complete resolution with antibiotics.

Table 3—*Showing Presenting Features, Radiographic and Laboratory Findings*

No. of cases	**Presenting features**	Radiographic findings	Serum bilirubin	Serum alkaline phosphatase	Serum glutamic oxaloacetic transaminase	Prothrombin time	Blood urea	Blood NPN	Blood sugar	WBC count	Platelet count	Result
12	**Temperature 101-103°F, chills, shivering, biliary colic, obstructive jaundice, vomiting and tenderness in right upper quadrant**	Stones in the gall bladder in 5. Stone in the common bile duct in one	Elevated (2.6-6 mg. per cent)	Significantly elevated in 4; normal in 4	Normal	Normal	Normal	Normal	Normal	Normal in 1: leucocytosis in 11. (18,000-26,000 per cmm.)	Normal	**Survived**
8	**Same features with endotoxic shock**	—	**Elevated**	**Elevated**	Normal	Normal in 6; elevated in 2	Normal	Normal	Normal	**Leucocytosis**	**Normal in 4; thrombocytopenia in 4**	**Survived**
5	**Temperature 105-107°F with same features and endotoxic shock**	—	**Elevated**	**Elevated**	**Elevated in 3; normal in 2**	**Elevated**	**Elevated in 1; normal in 4**	**Elevated in 1; normal in 4**	**Normal in 4; hypoglycaemia in 1**	**Leucocytosis**	**Thrombocytopenia**	**2 died**
1	**Painless jaundice, afebrile. marked lethergy and no appetite**	—	**Elevated**	Elevated	**Elevated**	**Elevated**	**Elevated**	**Elevated**	**Hypoglycaemic**	**Leucopenia**	**Normal**	**Died Autopsy done**

3 patients had acute renal failure with one recovery and 2 deaths.

DISCUSSION

Hypoglycaemia is a rare clinical entity in acute suppurative cholangitis. It was observed in 2 cases in this series and was corrected with intravenous hypertonic glucose solution.

In this series 13 cases had endotoxic shock. Of these 9 cases had thrombocytopenia. They were all treated with blood transfusion and intravenous hydrocortisone with some improvement in 8 cases. 5 cases were refractory. Thrombocytopenic cases run the risk of acute haemorrhage before, during and after operation and need prompt attention as soon as it is detected.

In the face of grave complications like septicaemia, endotoxic shock and thrombocytopenia intensive medical treatment fails to improve the patients and demands emergency surgical intervention even with great risk. It could be presumed that undertaken of such a risk of worthwhile being aware of the fact that outcome might be fatal. In this series there were 5 patients with grave complications and decompression of biliary tract was undertaken with fatality in 2 cases.

Cholecystostomy in addition to choledocholithotomy with T tube drainage may be acceptable procedure if the condition of the patient does not permit prolonged operation or cholecystectomy becomes technically difficult in a gravely ill patients or both. In this series one patient had to be treated by this procedure. Disadvantage of this procedure is that the gall bladder may again become the site of stone formation or carcinoma. These complications can be avoided by doing cholecystectomy when the condition of the patient permits.

Fatal postoperative complication in this series was acute renal failure. Its incidence has been markedly lowered by the use of mannitol during and after operation. There were 3 cases of acute renal failure with 2 deaths. It occurred in patients who had severe endotoxic shock and were refractory to intensive conservative treatment requiring emergency operation. Renal failure was attributed to acute tubular necrosis.

SUMMARY

Clinical, radiological and laboratory data of 26 cases of acute obstructive cholangitis has been presented. Complications like hypoglycaemia, thrombocytopenia and renal failure are discussed.

ACKNOWLEDGEMENT

I am grateful to Professor K. P. Sengupta, Principal and Superintendent, B. S. Medical College and Hospitals, Bankura for his kind help, advice and guidance and also for the permission to review the case records.

PRACTITIONERS' SERIES

Mother on the Watch

CLAIRE ISBISTER*

In these fast changing times with technology and science sweeping us into the future more quickly than we can adapt ourselves to it, and Womens' Liberation urging drastic changes in woman's role, every mother must try to stand back and take a cool dispassionate look at what it means to be a mother and what her responsibilities are.

To appreciate the place of the mother in the family, the words of Sir John Spence, author of the famous *One Thousand Families Survey* published some 20 years ago, are well worth recalling: "In the study of these families and in attempting to correlate their environments with the health of the children, there emerged one dominating factor—the capacity of the mother. If she failed, her children suffered. If she coped with life skillfully and pluckily, she was a safeguard to their health. In spite of lapses and failures, the mother stands out as the cornerstone of the family structure, and our experience confirms that in all sections of the community she remains the chief guardian of child welfare."

Thus the mother is seen as the custodian of the child's health—health in the sense of WHO's definition as complete physical, mental and social well-being and not merely the absence of disease or infirmity. The responsibility of the mother and the family to promote this state of well-being becomes obvious when it is realised that health is dependent on three major factors: heredity, environment—from the time of conception—and the ability of those caring for the child to manipulate the environment to meet his needs.

The family provides both the heredity and environment, the mother being responsible for half the heredity and, in the intra-uterine period, the total environment. As the main controller of

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the environment for at least five years after birth the mother has paramount responsibility for the child's well-being.

In his book *Attachment*, Bowlby discusses how man and other animals have needed the social group for their evolution and survival. The family, which is the basic unit of the social group in man, provides the protected environment in which the needs of the young can be met and the dangers to their health and well-being minimised. In it they learn to survive and reproduce themselves, and acquire habits and ways of coping with their environment. Bowlby points out that in all groups the mother-child relationship is a constant one. In the case of humans, the more the species has developed, the more compact has the father-mother-child family become and the mother-child relationship grown closer. The family has to provide protection, security and support for a very long period until the human child can take his place in a complex technological world.

The last 50 years have seen great changes in the family structure and the role of woman. Changes such as the education of women, their inclusion in the general work force, the instability of modern marriage and the stresses within and upon the family, all underline the need for both parents to understand the needs of the children and their responsibility towards them.

HAZARDS

What are the main hazards that a child in today's world faces and what can a mother do about them ?

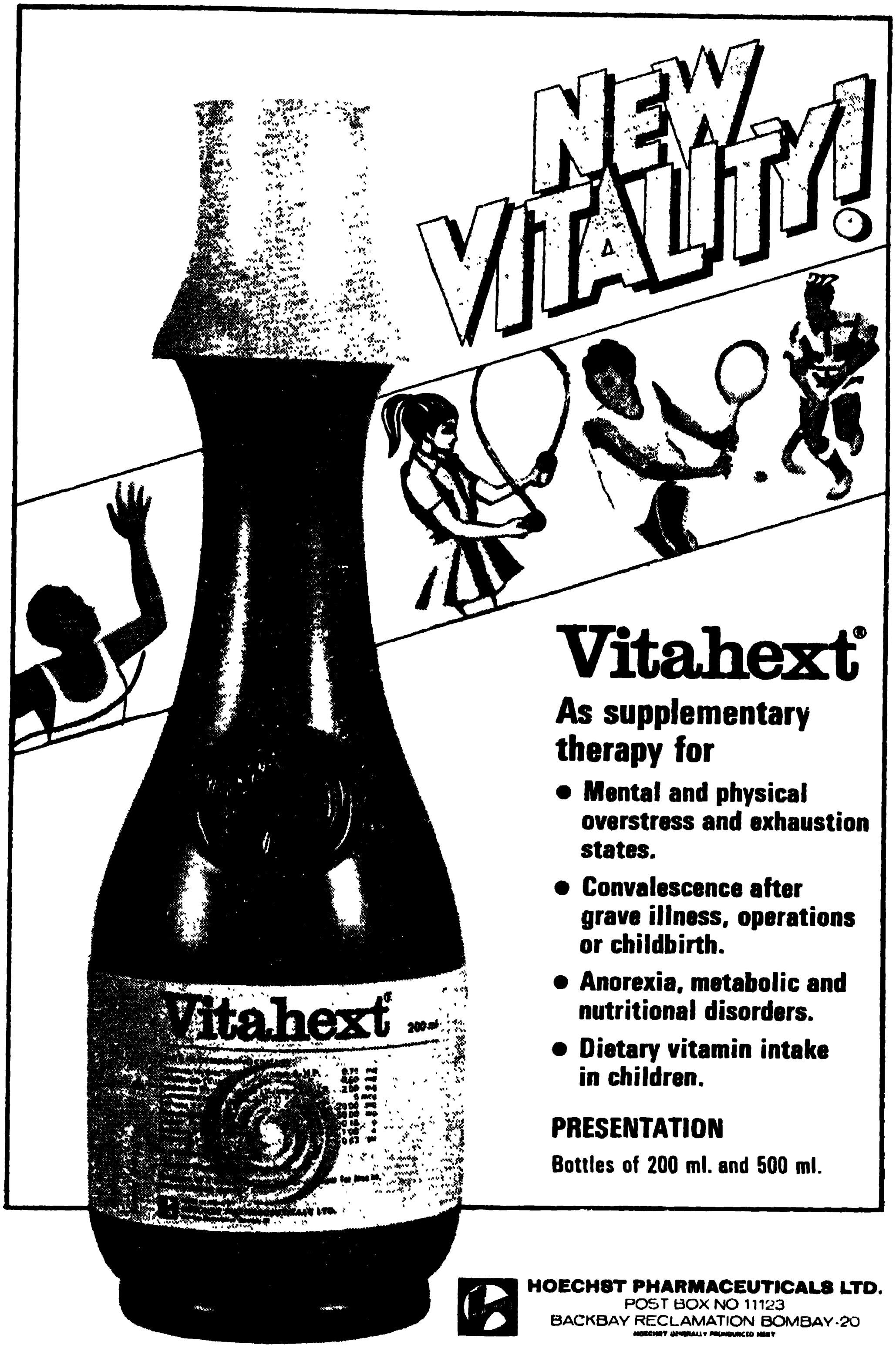
Available statistics from various countries give an indication of the number of children who start life with a handicap. Approximately 5 per cent have a cogenital abnormality of some severity including defects of hearing and sight not detected at birth, about 5 per cent are mentally retarded (I.Q. below 75) and about 2 per cent more have some degree of spasticity. Many lives are lost in the perinatal period (the time immediately preceding the birth and the first week of life), the main causes of death being preterm or premature birth, abnormalities present at birth, and difficulties associated with birth and with establishing existence separate from the mother. Even in countries with good medical facilities, the figure for perinatal deaths may be more than 30 per 1000 live births. Other important causes are infection, malnutrition and the mysterious 'cot death' (S.I.D.S.) usually occurring in the first three months. In the 1-4 year age group, the growing child's life is threatened by accidents, such as poisoning, falls, drowning, and motor vehicle accidents, violence as well as many infections, mainly respiratory. In the developing countries a combination of infection and malnutrition is the main cause of death and still exceeds accidents as a cause of death among children of school age.

REASONS FOR MEDICAL ATTENTION

Causes of death do not provide the only index of the incidence of illness or the main reason why a child may need a doctor's help. Ten years ago the National Health and Medical Research Council of Australia, with the help of 70 general practitioners, did a survey to determine the main reasons for children being brought to the doctor. In the first year of life, it was found, the main reason was immunisation or check-up. The main symptoms causing concern in this age group were coughs and colds, digestive upsets, and skin rashes. Classified under diagnoses they represented infections, allergies, and psychological and nervous disorders. In the 1-4 year age group respiratory symptoms were the main reason for the child being brought to the doctor, followed by immunisation and accidents, particularly cuts and bruises. Then came nervous and emotional problems, and digestive symptoms. Many of the children with respiratory and digestive symptoms were found to have been allergic and often not recognised as such.

FEEDING THE CHILD

Inadequate nutrition can be a threat to the child's health in countries which have a shortage of food as well as those which have it in plenty. Nutrition is no longer the simple matter it used to be. Supermarkets with abundant food are no guarantee that the people will get the best or even adequate nutrition. The food shopper has to know what is healthy food and what are the special nutritional needs of the various members of the family. Even more important is the problem of feeding the child in the first few months of life. Recent advances in biochemistry have made it apparent that optimal nutrition in the first six months of life is necessary for normal brain development, and that unbalanced and inadequate feeding tends to contribute to illness in later life. In this context the decline in the practice of breast-feeding is causing much concern to doctors. Research in the United Kingdom (Osborne) has shown degenerative conditions in blood vessels occurring in teenagers who had been artificially fed as infants. Sudden death in infancy ("cot deaths") has become one of the main causes of death under three months in Britain and the USA. The main associated factor appears to be artificial feeding : allergy and viral infection are probably the actual causes.



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The importance of breast-feeding is also emphasised by recent demonstrations of the role of colostrum—the yellowish fluid that comes from the breast after child-birth and before the milk flow begins—in protecting the child from infections, particularly infections of the intestinal tract, and against food allergies. This may explain why allergies are more common in artificially-fed babies than in the breast-fed.

The substituting of artificial foods for breast milk is particularly hazardous in developing countries where satisfactory substitutes are not always available, and narrow commercial interests and westernisation may have a deleterious influence on the indigenous people. This can be countered by organising educational programmes directed to the mother and to health and other workers coming in contact with her. In this way awareness can be spread of the dangers of inadequate nutrition to physical and mental development.

INADEQUATE MOTHERING

The stresses of society on the family often interfere with the mother's ability and desire to care for her child. The battered baby syndrome is an increasingly serious result of modern living. The early return of women to work after delivery, particularly in the developing countries, is preventing many mothers from breast-feeding. They wrongly think it is not worthwhile starting the infant on mother's milk because it can be given for a month only—which is all the maternity leave a woman can take in some countries. This must also inevitably affect the mother-child relationship and consequently the mental health of the child, unless there is an adequate mother substitute.

Some experts are stressing the desirability of the mother giving the main care to the child for the first three years of life even if she has to be compensated for the income lost. They discourage outside work unless it is part-time and allows the mother to be with baby for most meals.

THE MOTHER'S ROLE

In view of what is known today about the major threats to the well-being of children and what recent advances in medicine and surgery can accomplish, there is certainly much that a vigilant mother with the help of other members of the family can do to prevent illness in her child and actively promote good health. What she can actually do must depend to a certain extent on the environment in which she lives and the extent to which she can manipulate it to protect her child and supply his needs.

Her first responsibility must be to realise that a child should be brought forth only by parents who want him and are prepared to give him a home, loving care and the basic needs of life. A child has a need for a father and a mother in a committed long-term relationship. The statistics in some countries for the one parent family, poor social conditions and overpopulation, tell of physical and emotional ill health in children. The answer to these problems is increased responsibility in personal relationships, better knowledge of family planning, more education for living that includes respect for human life.

An allied problem is behaviour disorders among children and young adults. The best way to prevent children from developing behaviour problems appears for them to have a loving family with mature responsible parents. The Spence study, referred to earlier, underlines the importance of both parents with emphasis on the mother in the early years and later on the father. In the extended families in developing countries other members of the family also have important roles to play. But the increasing stresses of contemporary society in some places, the great influence of the mass media impinging directly on the child, and the early isolation of the child within his peer group, from the pre-school age until he completes his formal education, have whittled down the family influence. This makes the need even greater for a loving responsible mother to spend more time with her children in the early years. Those responsible for children deprived of maternal care should also realise the importance of forming a warm relationship with them to prevent the damage done by emotional deprivation.

The mother's health during pregnancy is now accepted as of great importance to the developing child. Since German measles and thalidomide drastically burst on the scene, attention has been drawn to other illnesses and drugs, and to the quality of nutrition received by the developing foetus across the placenta. In the womb the child depends on his mother for everything, oxygen, nutrients, removal of waste, warmth, protection, both physical and biochemical. It is apparent that many of the congenital abnormalities and later mental retardation must arise from noxious influences that reach the child in the uterus. Alcohol and tobacco may not be as damaging as heroin but they are much commoner noxious drugs to cross the placenta to the child. Prematurity and birth injury are the two main causes of brain damage, and both can be greatly reduced by good antenatal care and skilled obstetrics. The expectant mother should see to it that her own health and diet are as good as possible, and that she receives professional care before, during and after the delivery of her child. In most countries attempts are made to provide facilities for those who cannot afford adequate medical care, as well as educational programmes for preparation for parenthood. In the rural areas, especially in developing countries, health services are often not adequate.

In areas where better care is available, more preterm babies are surviving, birth trauma is less serious, and the syndromes due to minimal brain damage are assuming more importance. One finds the evidence in overactive infants, crying babies, children with unprovoked temper tantrums, late talking, late walking, and learning difficulties.

More genetic conditions are becoming amenable to treatment and prevention, such as the disturbances of metabolism where a child cannot use some constituent of normal food as in PKU (phenylketonuria), and may show symptoms of backwardness and failure to thrive. Development problems can appear later as a learning difficulty and distracting behaviour, but an observant mother may report clumsiness, delayed speech and persistent ambidexterity.

It is possible today to apply the surgeon's skill to correct many congenital abnormalities. Where adequate services are available, the early detection of any malformation, and recognition of the first signs of ill health, can greatly reduce the problems that may arise from them. Physiotherapy and appropriate exercises given early, while the bones are soft, may well prevent the need for surgery in some orthopaedic conditions. Of course, examination by a doctor in the first year is important because the mother cannot always recognise abnormalities and failure to thrive, particularly if the child is her first-born. The responsible mother takes advantage of community health services, protects her child against disease with immunisation and seeks professional advice when necessary.

However, no matter what community services are available there is nothing that can replace the day-to-day care and observation of a mother genuinely interested in the welfare of her child. Many women return to work too soon and do not really get to know their child or the signs of ill health. They may know little of child-care as modern education does not prepare women for home-making and child-rearing. In fact many women in technologically advanced societies have learned only how to earn a living and are frustrated and discontented in the role of wife and mother. They may never really become mothers in any more than a physical sense.

In addition to learning about nutrition and hygiene, a mother needs to understand child development and behaviour so that she can recognise the signs if her child is not progressing normally or needs professional help. It is the vigilant mother who first detects hernias, strain in passing urine, breathlessness on feeding or exercise, a squint persisting after the first few months, defective hearing, lateness in talking and walking.

It is the mother, too, who is first on the scene of an accident. She should know something about first aid and have a medicine cupboard equipped for every day needs. Accidents are largely preventable if the parents are familiar with child behaviour and know what to expect from inquisitive, enterprising children. The mother who has left boiling water where a child can reach it or a father who has placed a bottle of lethal insecticide on the floor while he sprays the garden is perhaps not unaware of the danger but has misjudged the speed and inquisitiveness of the child.

It is a great help for the mother, if she is to do her task with joy and satisfaction, to have a husband who will relate warmly to her and the children and guide them in their adjustments to the outside world. But many women do not have this kind of support, and they and their children will need more service from the society in which they live. Governments will need to take active measures to help mothers to meet their children's needs by providing health educators, health visitors, child health centres and special allowances.

Through a mother, the baby first learns to love and accept love, knows the feeling of security and joy in achievement as he crawls, stands and is encouraged. He comes to recognise himself as an individual. He experiments in independence as mother guides him to keep him out of danger. It is usually through her stimulation that he recognises colours and shapes and musical sounds, and starts to communicate with others in words learned from his mother. He absorbs much of her attitude to life, truth and other people as he spends his days with her, as she feeds and bathes him and puts him to sleep. A mother with a knowledge of infant care and infant needs, and a willingness to meet them, is a great advantage to the child. She is the main guardian of her child's health and on her knowledge of child behaviour and children's needs will largely depend the physical, mental and emotional health of her child.

(Courtesy : WHO)

CASE NOTES

1

Iatrogenic Reversible Horner's Syndrome

B. DAS*, A. CHARAN**, K. SINHA***

Johann Friedrich Horner (1869) first described a syndrome characterised by unilateral miosis, ptosis, enophthalmos and anhidrosis due to the involvement of the sympathetic pathways in its long course from the brain to the eye. A large number of conditions have been reported to cause Horner's syndrome e.g., congenital (Robinson *et al.*, 1965), birth trauma (Makley and Abbot, 1965), trauma to the cervical region, cervical, mediastinal and pulmonary malignancy, cervical sympathectomy, carotid body tumour (Akkary, 1964), cervical chondroma (Firkins, 1964), osteophytes from the cervical vertebrae (Khurana and Hunter, 1964). We encountered an unusual case of Horner's syndrome which appeared 9 weeks after scalenotomy through a left supraclavicular incision and was caused by a left over gauze piece in the wound.

CASE REPORT

A. K., a 30-year-old policeman was admitted on 11-9-1970 in the Thoracic and Cardiovascular Surgery Unit of the G. M. and Associated Hospitals with the complaints of persisting discharging sinuses on the left side in the supraclavicular region and ptosis on the left side. Four months back he had heaviness and burning sensation in the left upper limb with difficulty in abduction and muscular weakness in the left upper limb. He was admitted in a district hospital where he was diagnosed as having a cervical rib on the left side. Cervical scalenotomy was performed through a left supraclavicular incision. During the postoperative period the sensation of heaviness, burning and weakness in the left upper limb disappeared but a discharging sinus persisted in the line of the supraclavicular incision. The patient was discharged from the hospital after 8 weeks when the sinus finally healed up. One week after his discharge from the hospital the patient noticed gradually progressive ptosis on the left side. The sinus in the supraclavicular incision opened up again and started discharging seropurulent material.

At the time of admission in our unit the patient was having ptosis, enophthalmos, miosis with absent spinociliary reflex on the left side and anhidrosis on the left side of the face. Pulse rate was 80/minute, B.P. 120/80 mm. Hg in both the upper limbs, temperature was 38°C.

Investigations—Haemoglobin—11.2 g. per cent, total leucocyte count—8600/c.mm. with polymorphs—73 per cent, lymphocytes—22 per cent, eosinophils—5 per cent. Pus culture from the cervical sinus showed growth of *Staphylococcus aureus* sensitive to streptomycin, penicillin and oxytetracycline dihydrate.

Management—Under general anaesthesia the supraclavicular incision was re-explored. There was a roll of gauze piece about 4 cm. in diameter lying burried in the wound surrounded by granulation tissue. The gauze piece was taken out, the cavity was curretted and the wound was closed. It healed up in 8 days.

Improvement in the ptosis was noted on the third postoperative day and in 15 days the ptosis, miosis and enophthalmos disappeared.

DISCUSSION

The fact that Horner's syndrome developed 9 weeks after surgery in this case rules out the possibility of the direct surgical trauma being the causative factor. The progression was gradual and the recovery was prompt and complete. Most probably, pressure by the gauze piece on the cervical sympathetic trunk as well as surrounding fibrosis and inflammation, all played some role in the interruption of the sympathetic pathways. But the most important factor appears to be the pressure by the gauze piece because the recovery started on the 3rd day and was fairly rapid. Although Horner's syndrome was present but there was no evidence of involvement of the brachial plexus or subclavian and carotid vessels.

SUMMARY

A case of Horner's syndrome caused by a left over gauze piece during scalenotomy through the supraclavicular incision has been reported. Removal of the gauze piece resulted in complete recovery.

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2

Stylalgia

B. M. ABROL*, G. DASGUPTA**

Stylalgia is a pain syndrome occurring in presence of an elongated styloid process. This syndrome is more common than is generally thought and explains many of the vague symptoms of pain in the region of neck and face. This has prompted us to report this case.

CASE REPORT

K. D. a 60-year-old female was admitted in the E. N. T. Department of All-India Institute of Medical Sciences with the complaint of pain in right half of the throat for 6 years which used to radiate to the right ear. She had been treated with various types of medical treatment earlier, for sore throat and neuralgia, without any effect. There was no history of ear discharge in the past. She was referred with a provisional diagnosis of malignancy throat by a practitioner.

On examination the patient was partially edentulous with atrophied tonsils both sides. Right tonsil was slightly bigger than the left and contained retention cyst of 1 cm. diameter, near the upper pole. A sharp bony projection could be palpated about the middle of the right tonsil. Tonsillar gland was just palpable. Nose and ear were essentially normal.

Investigations—Routine examinations of blood and urine revealed no abnormality. X-ray of cervical spine did not reveal any spondylitic change. Styloid process could not be delineated definitely. X-ray chest was clear.

Treatment—Tonsillectomy was done first under general anaesthesia. Bony projection was again palpated in the right fossa. A small longitudinal incision was made over the bony projection and the tip of the styloid process up to its root was exposed. The glossopharyngeal nerve was stretched over it. The stylohyoid ligament was bony hard. The muscles and ligaments attached to the styloid process were dissected off the bony process. About 2 cm. of the bony process was excised. The dissected tissues were approximated with catgut.

Postoperative period was uneventful and the patient was discharged after 7 days, when he was completely relieved of pain.

DISCUSSION

The normal styloid process is a small, slender, elongated, tapering and cylindrical bone, 2.5 cm. long in adults and juts anteriorly, inferiorly and medially from the under surface of the temporal bone. The tip is continuous with the stylohyoid ligament, linking the base of the skull to the lesser cornu of the hyoid bone. The ligament may ossify and styloid process may be elongated when it is palpable through the wall of the pharynx. Cavenagh (1937, quoted by Asherson, 1957) recorded a case where ossification spread from styloid to hyoid and prevented peroral endoscopy. The elongated styloid process occurs in 4 per cent of the population and a few give rise to symptoms (Dwight, 1907, quoted by Asherson, *loc. cit.*). However, elongated or incurved styloid process may jut against the glossopharyngeal nerve which is intimately related to it and its attached muscles (Asherson, *loc. cit.*).

Fitz (1940, quoted by Harma, 1967), Eagle (1948, 1962), Lajda (1958, quoted by Harma, *loc. cit.*), Nara (1958, quoted by Harma, *loc. cit.*) and Harma (*loc. cit.*) had reported variable number of cases of elongated styloid process causing pain, which was relieved after resection. Compression of the wall of the pharynx, on the carotid artery, chorda tympani nerve or lower branch of Vth cranial nerve, had been postulated by different authors as aetiology of pain in these cases. Harma (*loc. cit.*) had analysed the site of pain in his series of 52 patients and showed that in majority the pain was complained either in the neck, throat or in the ear. The case under discussion also had pain in the throat which radiated towards the ear. Some of these symptoms and resistance to conventional treatment make the unwary treating physician diagnose such a case as malignancy as in the present case. It is interesting to note that while in many cases, the elongated styloid process remain symptomless throughout life, quite a few develop pain in the later years. Most of the cases in literature had developed symptoms in the 4th to 6th decades of life. Oldest patient of Harma's series was 83 years old. Evidently the involutional changes that take place with aging may cause the onset of pain. One such change is discus degeneration of the cervical vertebrae which shortens the spine and alters the position of the styloid process.

Different techniques had been utilised for resecting the elongated styloid process. Transpharyngeal excision of the elongated process (Eagle, 1948) had been used in the present case, as it was easily accessible through the tonsillar fossa. External approach through the anterior border of sternomastoid had also been used by Asherson (*loc. cit.*).

SUMMARY

A case of neuralgia with elongated styloid process has been reported. Complete cure of the pain after resecting the elongated process was achieved. A short review of literature has been done to document the possible aetiology of stylalgia.

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tendent, All-India Institute of Medical Sciences, for his kind permission to publish this case.

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3

Dapsone Toxicity

K. C. VERMA*, KRISHANBIR SINGH**,
S. D. CHOWDHARY***

The development of toxic side effects during prolonged dapsone therapy in leprosy is of common occurrence. One generally comes across minor side effects like headache, urticaria and gastro-intestinal disturbances. The major toxic effects like haemolytic anaemias, agranulocytosis and other blood dyscrasias are rare but the rarest of all is the development of psychosis (Sahu, 1972) which is a serious and adverse reaction to dapsone therapy. Due to the rarity of this serious side effect of dapsone, we thought it worthwhile to publish the report of a case of leprosy who developed psychosis after 1½ years of the start of depsone therapy.

CASE REPORT

Kamla Yadav, a 30-year-old female, was registered for the first time in the leprosy clinic of skin and V.D. department of Medical College and Hospital, Rohtak on 10-10-1970. She was diagnosed as a case of lepromatous leprosy and was put on dapsone therapy with a starting dose of 25 mg. twice a week. The dose was gradually increased till a maximum dose of 300 mg. in a week was reached on 25-3-1971. On 22-4-1971, the patient came to the leprosy clinic with urticarial rashes all over the body. Dapsone was discontinued and antihistiminics were administered. Urticaria disappeared in about a week. Dapsone therapy was re-instituted with an initial small dose of 10 mg. twice a week. The dose was gradually increased to attain a maximum of 300 mg. in a week. On 21-9-1971 the patient reported with lepra reaction. She had fever, joint pains, vomiting and fresh tender plaques. Dapsone was stopped and she was put on calcium gluconate, antimalarials, analgesics and sedatives. The reaction subsided in about ten days. Dapsone therapy was restarted with 5 mg. biweekly and the dose was very slowly increased till a maximum dose of 300 mg. in a week was attained.

On 12-4-1972, the patient came to our clinic with the development of frank psychosis. Her behaviour was odd. She was complaining of sleeplessness and was talking incoherently. She was referred to the psychiatric ward where she was admitted with the diagnosis of psychosis. She was given three E.C.T. shocks and was put on trifluoperazine and oxazepam. Her symptoms soon abated. On complete recovery from this malady she was re-exposed to dapsone in the doses of 50 mg. daily. Relapse of psychosis soon occurred and dapsone was finally stopped. For the last 2 months the patient has not attended the clinic.

COMMENTS

The development of psychosis during prolonged dapsone therapy in leprosy is a rare but serious side effect. Its rarity has been stressed by Sahu *(loc. cit.)*. The serious side effects due to dapsone do not, as a rule, occur when the patient is kept on small doses of dapsone and unnecessary high doses are avoided (Dharmendra, 1967). Cochrane (1964) and Sahu *(loc. cit.)* also hold the same view regarding the occurrence of psychosis with high doses of dapsone. This view probably seems to be true because all the adverse reactions in our patient occurred when a maximum dose of 300 mg. of dapsone in a week was administered to her.

Molesworth and Narayanswamy (1952) thought that this adverse reaction is only frequent in patients with family history of psychosis. In case of our patient no history of psychosis was available in her family. Another significant point regarding this illness is that the patient, recovering from this type of psychosis, is often able to resume dapsone therapy (Rook *et al.*, 1968). At present we can not comment on this point because we have not followed the patient for a sufficiently long period after the illness.

SUMMARY

A case of lepromatous leprosy developing some of the adverse reactions, including psychosis, to dapsone therapy is presented.

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Health Begins at Home

Primitive man built home mainly for protection against hostile creatures, including others of his species and extremes of weather. With the progress of civilisation this basic concept of home changed from a mere place of physical shelter to a centre for growth and well-being of the family as a whole. The home is again dependent on its surroundings and environment varying sharply from rural, agricultural and non-industrial set-up to industrialised urban areas with special problems of food adulteration, air polution, scantiness of water supply and over-population. The destiny of a man is determined by the community to which he belongs and through the community health only a man's home can be made safer and healthier[1].

If health begins at home then it is imperative that we redefine its relationship with the hospitals and medical institutions and reformulate in the light of this emphasis the proper functions of a modern hospital. The first important question that arises is whether a modern hospital should merely be a shelter for the sick or it should be a centre for continuing the education of its staff and students. The answer furnished by the international experiences of health planners is that it should be a centre for community health services, preventive as well as curative. A hospital should not only be limited to curative medicine but it should properly be interested in prevention also[2]. And a home represented by a family unit plays no less important a role in this preventive aspect of community health. Unless individuals are healthy, the families or communities to which they belong cannot also be healthy[3]. On the other hand individuals cannot remain healthy if there is any adverse health condition in the community. Control of communicable diseases, environmental sanitation, safe water supply, disposal of human excreta, disposal of rubbish and garbage, food hygiene, housing, control of vectors and others depend on the local situation, which again is dependent on the involvement of the people. Community participation is essential to make the community health activities successful. Immunisation has proved to be one of the most effective methods of protecting both the individual and the community from attacks of certain infectious diseases. Immunisation against infectious diseases may be either the only satisfactory method of control as in the case of smallpox, poliomyelitis, measles, diphtheria, tetanus, whooping cough, yellow fever, and possibly influenza, or it may be useful along with other health measures for typhoid, tuberculosis, cholera and rabies. Individual care and community participation are essential to make such immunisation programme successful[4].

The problem of malnutrition and undernutrition confronting children and infants poses another serious difficulty for the health of the people of the developing countries[5]. Infant mortality in these countries is high and most of the deaths occur in the neonatal period. While many children die, many others survive only to carry with them the prolonged effects of malnutrition to their adult life. This may result in permanent deterioration of physical and mental health.

Gopalan[6] emphasised two broad sets of causes for malnutrition among the growing children in developing countries—an inadequate supply of foods necessary for the infants or children, and ineffective utilisation of such foods as are available due to ignorance of the people. More effective utilisation of such protective foods which are available, requires nutrition education and proper feeding habits[7]. This knowledge may be imparted through the health centres and maternal and child health centres. Motivation of individuals and families can exert immense influence on augmenting the production of protective foods and removal of existing social, physical, economic and cultural barriers in the way of our adaptation to such foods. Proper distribution and effective utilisation of the available foods also require to be ensured to mitigate the problem of malnutrition and undernutrition.

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[7] CHAKRABORTY, BIJON—*J. Indian M. A.*, **60**: 129, 1973.

A child's development, both physical and mental, is directly dependent on the parental environment[8]. Babies are well looked after and brought up in perfect surroundings if the parents are perfectly normal and socially well adjusted. Maternal neglect may lead to series of disturbances in child's mental health and this again may originate from disturbed state of the family life[9].

Schaefer[10] has rightly commented on the World Health Day theme "Health begins at home" as follows—"No man's home is safer or more healthful, ultimately than the state of safety and healthfulness of the community of which it is a part. It is only through community health action that each man's home can be a true shelter against the hazards of his environment". From this concept of health, health education has got enormous influence on the proper perspective of community health[11]. The full growth of health education only occurs when every individual of a community takes active part in the health programme. And this can be ensured only if like charity, health begins at home.

N. N. ROY CHOWDHURY

Bridging the Gap

The profession and this Association have learnt with some satisfaction that the Hon'ble Union Minister of State for Health and Family Planning "appeared to be sympathetic to the views of the I.M.A. and gave Dr. Bhide (I.M.A. President) to understand that the Rural Health Scheme as also the issue of registration of quacks would be reconsidered and the stand taken by the I.M.A. would be kept in view". It is earnestly hoped that the dialogue that has now begun and led to the postponment of observance of All India Black Day will lead to something more concrete because in spite of all that has been written and said over the last few months, there is, between the stand of the profession and that of the Government, much that is mutually acceptable.

Both sides admit without hesitation that 'the rural areas are still lagging far behind the urban areas in the matter of medical relief and care', and agree on the urgent 'need for increasing the accessibility of health services in rural areas'. Both sides want that the country's population should be as healthy as possible, in other words in 'a state of complete physical, mental and social well-being'. Both sides want that life expectancy should rise, that death rate should fall and population expansion should be prevented by a *pari passu* fall in birth rate. To the credit of both it can be said that over the last 25 years life expectancy has in fact significantly increased, and death rate has significantly fallen, though the difference has not been up to the expectations of either. Both sides are deeply concerned over the fact that birth rate has not fallen significantly at all, and are committed, though in different ways, to give family planning programmes the topmost priority.

Just at the moment however, the matter of rural medical relief is uppermost in everyone's mind, and on this there is considerable difference of opinion. The Government feels that the training that has been imparted to practitioners of modern medicine over the last 25 years has made them by and large unsuited to serve the primary needs of the community in which they were born and bred. The profession can merely point out that the overwhelming bulk of this training has been the Government's direct responsibility, and that the considered views of this Association and other learned bodies have not usually been implemented. Over the years, Government has thought it fit to encourage and boost up the performance of systems of medicine not adequately based on science and not necessarily indigenous. Relying upon the innate discriminative capacity of the people to assert itself in the long run, the profession has so far maintained a discrete silence on this matter.

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[10] SCHAEFER, MORRIS—World Health Day 1973. Material Distributed by the World Health Organisation, Geneva.

[11] STEUART GUY, W.—A Practice of Social Medicine, Ed., Kark and Steuart, 1962, Livingstone, Edinburg and London, p. 65.

Silence can no longer be maintained because Government now proposes to create at considerable expense a hybrid creature called R.M.P. It proposes that registered and unregistered practitioners of any of the systems of medicine prevalent in this country be imparted four-month's training and then called upon to manage individual diseases according to ayurveda, unani, homoeopathy and allopathy. It proposes that these R.M.Ps. will be partly trained and apparently fully supervised by registered practitioners of modern medicine. It obviously believes that there are two kinds of sick people—the urban sick for whom will be available the amenities of modern medicine and the rural sick upon whom the hybrid R.M.Ps. can be let loose with impunity.

The profession simply cannot agree to this. The constitution of the land guarantees equality of opportunity to all sections of the community and this scheme is an attempt to hoodwink the rural population to accept as good something which is positively harmful. The profession can under no circumstances allow its members to be associated with either the training or the supervision of individuals who are expected to follow unscientific systems of medicine.

The profession like the Government believes that there are indeed two kinds of sick people —those who really need the services of a qualified doctor, or in other words, a practitioner of modern medicine, and those who do not. It believes that the services of qualified personnel could be conserved for those who are in real need and that alternative personnel be made available for other duties. Four months would be adequate time to train an army of semiskilled workers who could be labelled health assistants or nursing assistants and whose duties would include sorting out the patients who should be seen by a medical practitioner, ensuring that the management prescribed is carried out, administering supportive therapy and reporting progress to the medical practitioner. With a little more time, say about a year, more skilled workers could be produced who could be given increasing responsibility. Under no condition would they be entitled to the independent practice of medicine or deal with remedies outside the field of scientific medicine.

While encouraging the deployment of practitioners of scientific medicine in the rural areas as much as possible, the profession does not believe that all facilities for medical care for the really sick can be provided in every village. Some of the less complicated services can be arranged in the primary health centres, but more elaborate services will have to be concentrated in semi-urban or urban centres (subdivisional or district headquarters) with arrangements for rapid transport and institutional care. Super-speciality services can only be set up in metropolitan centres, but these should be just as easily accessible to the rural sick as to the urban sick. The profession believes strongly that a villager will be much happier to find good scientific treatment provided for him at a distance from his home than to be left in the hands of a quack next door.

However, provision for the management of the sick is only a small part of national health care. There is an ageold maxim that a stitch in time saves nine; in matters of health, prevention is a great deal better and cheaper than cure. The profession therefore believes that long before there is any talk of expanding benefits for the sick, three things must be achieved throughout the length and breadth of this country. Priority number one is the control of communicable diseases. This entails the provision of an adequate supply of uncontaminated water, adequate arrangements for the disposal of refuse and excreta, the building up of immunity by suitable inoculation, suitable isolation of victims of communicable disease, eradication of vectors, and above all educating the entire population in the elementary principles of hygiene. There can be no doubt that money spent in just this will result in far greater production of national wealth and far less spending on the paraphernelia of medical relief.

Priority number two is the prevention of deficiency diseases, more particularly of protein calorie malnutrition and of vitamin and mineral deficiency. Freedom from hunger is of course one of man's fundamental rights, yet chronic malnutrition is very much with us and the medical profession alone cannot reverse the situation. It can however certainly wage a campaign against adulteration, against waste, against ignorance and superstition, and for special arrangements for the most vulnerable groups of the population.

This leads on to priority number three, the strengthening of maternity and child welfare services. It is absolutely essential to ensure arrangements for the care of the pregnant mother, the conduct of normal labour, the care of the normal newborn and infant, the preschool child and the schoolgoer, for without this the future of the nation is dark, indeed, and much of the money spent on Family Planning schemes would become a bad investment. As the profession has pointed out on many occasions, a mother will only agree to restrict the size of her family if she is confident that her existing offspring will be well looked after.

Suitable persons can easily be trained in a few months period to carry out the different aspects of this preventive programme ; it is essential that only one subject be taught to any one individual, so that he or she will be able to render the most effective service to the community after a minimum period of training.

Suitable persons could also be trained in a few months to augment the diagnostic services that can be made available to the rural community. With a relatively small outlay, the simpler clinical pathological examinations and the simpler x-ray examinations could be arranged on a much wider scale than at present by providing the necessary equipment, and by training one group of persons to examine blood, stool, urine and other body fluids, and another group to handle x-ray apparatus. It should not be necessary for the profession to explain to the Government the benefits that would accrue from such an investment, but if it is, a balance sheet could easily be drawn up to convince the unbelievers.

Finally one may conclude that to offer a placebo instead of the real thing merely because the placebo is cheap and the real thing is initially a little expensive is the surest way to disaster. There should be no doubt that just as an investment based on modern science has yielded rich dividends in the sphere of defence, a similar investment will yield equally rich dividends in the sphere of health. The profession can assure the Government that in the implementation of any plan based on modern science, it will not be found wanting.

SUBIR K. CHATTERJEE

CURRENT MEDICAL LITERATURE

Physiologic Significance of Central Venous Pressure in Patients with Haemorrhage

NORTHFIELD, T. C. and SMITH, T. (*Surg. Gynec. Obstet.*, **135**: 267, 1972) from the Department of Gastroenterology and Medical Research, Council Gastroenterology Research Unit, Central Middlesex Hospital, London, observe:

Measurements of central venous pressure, red cell volume, blood volume, and faecal blood loss have been carried out in 23 patients with acute gastrointestinal bleeding. Central venous pressure measurements on admission did not give a reliable indication of the degree of hypovolaemia, but there was a good correlation between measured blood volume after transfusion to a normal central venous pressure of 5 centimeters of water and predicted normal blood volume based on weight and sex. A subsequent fall in central venous pressure to zero was associated with a fall in red cell volume, together with further faecal blood loss. Lesser fluctuations in central venous pressure were not associated with any change in red cell volume or with any other evidence of further blood loss. These findings indicate that under clinical conditions of haemorrhage and blood transfusion, uncomplicated by other factors that may affect venomotor tone and cardiac function, central venous pressure mainly is dependent on blood volume.

Impairment of Cardiac Function in Patients with Pectus Excavatum

BEISER, G. D., EPSTEIN, S. E., STAMPFER, M., GOLDSTEIN, R. E., NOLAND, S. P. and LEVITSKY, S. (*New Eng. J. Med.*, **287**: 267, 1972) from the Cardiology Branch, National Heart and Lung Institute, Bethesda, Md. 20014, write:

Although pectus excavatum is thought to impair cardiac performance, no consistent haemodynamic abnormalities have been identified. We hypothesised that cardiac function might be impaired during upright exercise when the heart descends into the pectus deformity, Catheterisation of the right side of the heart in six patients with pectus excavatum gave normal results, and the haemodynamic response to supine exercise was normal. In contrast, cardiac output (CO) during intense upright exercise was low in two patients, at the lower limits of normal in one, and low normal in two. The CO and stroke-volume responses to mild upright exercise also differed from normal. After operative repair in three patients, CO during intense upright exercise increased an average of 38 per cent, and haemodynamic responses to mild upright exercise also changed toward normal. No alterations occurred in the response to supine exercise. Thus, pectus excavatum can reduce the pumping capacity of the heart during upright exercise, and haemodynamic improvement occurs after surgical correction.

Spondylitis Tuberculosa in the Danish Neolithic Age

SAGER, PH., SCHALIMTZEK, M. and MOLLER-CHRISTENSEN, V. (*Danish Med. Bull.*, **19**: 176, 1972) from the Institute of Medical History, University of Copenhagen, and the X-ray Department, The Orthopaedic Hospital, Copenhagen, write:

There is general agreement that it is difficult to make an exact diagnosis of tuberculous spondylitis from pathological changes in a spinal column which has long been buried.

In fact, it is not possible to be wholly sure of the diagnosis before the specific agent of the disease, the *Mycobacterium tuberculosis*, has been demonstrated. In a few cases, however, the lesions are so characteristic that, in spite of the absence of bacteriological findings, the diagnosis of tuberculosis may be regarded as most probable. This is the case, for example, with the mummy of a 25-30-year-old Egyptian priest of Amun from the XXIst dynasty (about 1000 years B.C.), which was excavated in 1891 in the neighbourhood of Thebes. The spinal column shows partial destruction of the lower thoracic and upper lumbar vertebrae, which together form an angular kyphotic deformity—a Pott's curvature or gibbus. In addition, a huge abscess cavity was found in the right psoas muscle.

On the basis of the above mentioned macroscopic, intra-vital, pathological bone changes, with the development of a block of fused vertebrae between thoracic vertebra III-IV, the possibility of a fracture can be excluded. The changes found, with destruction and synostosis of the bodies of the vertebrae and the formation of fistula, are in favour of an osteomyelitic process and against congenital fusion of a block of vertebrae.

The macroscopic bone changes observed, with the formation of a pronounced thoracic gibbus, are almost identical with the changes described in a sample of skeletons from the Middle Ages, in which tuberculous spondylitis was present, with the development of a Pott's curvature and abscess formation.

The x-ray finding definitely show the sequelae of an inflammatory process in the IIIrd and IVth thoracic vertebrae. Congenital malformations or the sequelae of fractures or tumours can be excluded.

Familial Recurrent Polyneuropathy

ROOS, D. and THYGESEN, P. (*Brain* **95**: 235, 1972) from the Departments of Neurology, of the Rigshospitalet, Copenhagen, and the Gentofte Hospital, Hellerup, Denmark, comment:

Recurrent polyneuropathy has been transmitted, as a dominant trait, through five generations to 19 members of a Danish family with strikingly small hands and feet.

The motor and/or sensory symptoms and signs of this neuropathy, mild or severe, sometimes in the form of paralysis, set in between the 4th and 26th year of life. They affect exclusively the limbs, sometimes as mononeuropathy within the individual attack. Recovery may be incomplete, at other times complete within hours, days, weeks, or months. The symptoms, or exacerbations of the symptoms, are acute and spontaneous, or provoked by pressure upon nerves. The interval, with or wihtout residual symptoms, may last for weeks, months or years. Only one member of the family is permanently disabled, while several are slightly handicapped.

Muscle biopsies disclosed typical neurogenous atrophy, and nerve biopsies showed destruction of myelin sheaths and neurofibrils.

Electromyography and measurement of sensory and motor velocity have confirmed the localisation of the disease in the peripheral motor and sensory neuron and have disclosed clinical mononeuropathy as polyneuropathy.

In symptoms and signs, the neuropathy in this family bears no similarity to the classical, genetically determined disorders of peripheral nerves, or to recurrent attacks of neuralgic amyotrophy (in some cases accompanied by cranial nerve signs) which predominate in the 10 families on record with recurrent polyneuropathy, in all cases with dominant transmission.

CURRENT TOPICS

1

The Conflicts Between Health Needs and Health Wants of Society*

Av LORD ROSENHEIM

The Fourth World Conference on Medical Education offers us an opportunity for stock-taking, for enquiring whether, in this chaotic and changing world, our efforts to train doctors are producing the right men and women, for the job. Even more important it gives us the opportunity of attempting to define the job for which we should be training them. Without such a double stock-taking, we can scarcely hope to discuss the main theme of this conference: Educating tomorrow's doctors.

Our understanding of the detailed structure and functions of the body and their derangement in disease has made astounding advances during the forty years since I ceased to be a medical student. In our stock-taking we must consider how far our greater scientific knowledge has been translated into effective action for the prevention and treatment of ill health in the individual and for the preservation of both his physical and mental health. These are, after all, the major objectives of the medical profession.

During the past decade there has been a growing awareness that despite the sophistication of our understanding of disease, inadequate attention has been paid to the delivery of health care to the individual. This awareness has arisen from a number of factors; mainly because of the changing pattern of disease, but also because of an increasing interest in psychological and social factors in disease and because of a growing belief in the inherent right of everyone to health.

Whenever we discuss the delivery of health care we must distinguish between the needs of the so-called developed and the developing countries. Both need better health care. In the developing countries the prime need remains the general improvement of hygiene and nutrition, the eradication of infection and parasitism. Individual health will be vastly improved by a rise in the standard of living, by advances in industrialisation and agriculture. The immediate care of the individual is of less urgent priority and yet the delivery of medical care in rural areas is of paramount importance and we have, I believe, much to learn from the efforts being made in many parts of the world to provide such care through team work of the doctor and his para-medical colleagues.

Elsewhere the major need is for the more even spread of medical care and the appreciation that, despite the high standard of living and the great advances in medicine, there are many who, as a result of genetic, environmental or economic cause, are under-privileged and do not receive the medical care that is their right. For the moment, I wish to confine my remarks to the developed countries, where we are also beginning to appreciate the need for team work in the delivery of medical care.

Looking back over my forty years of medical practice I cannot fail to note that, despite the virtual disappearance of many diseases, despite the great advances in prevention and therapy, the demand for medical care continues to be high. When I enter a medical ward, I can picture the patients who are no longer there; the adolescents with rheumatic fever, the young men with lobar pneumonia, the patients with tuberculosis, with manifestations of tertiary syphilis, with meningitis and the crippled victims of acute poliomyelitis. In place our wards are filled with the elderly, suffering from degenerative and neoplastic disease, from disorders of the immune response; patients whom we can patch up and sustain, but rarely cure.

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*Keynote address at The Fourth World Conference on Medical Education, Copenhagen 25th—29th September, 1972

With the control of so many diseases, many more people survive to old age and we are only beginning to face up to the problems of health, welfare and happiness in old people.

It is sad that the increasing potential for health has coincided with the growth of social, political and economic unease and that so many people, facing increasing frustration and anxiety in their daily life, develop depression or in other ways fail to achieve full mental and physical health.

Where doctors used to be summoned to deal with infectious disease, they are now increasingly expected to alleviate the effects of frustration, anxiety and social inadequacy; to act as priest and marriage counsellor, to sense the underlying call for help in the patient with recurring backache, to help the delinquent child in the alcoholic's household.

On either side of the Atlantic, in fact around the world, our young men and women have become increasingly aware of and appalled by the havoc caused by social deprivation and by the ill effects on both the present and subsequent generations of poverty, lack of education and fecklessness. While impressive and continuing advances are being made in the surgery of heart disease, in renal transplantation, in the management of hypertension and in the relief of cancer, both medical students and their teachers are increasingly aware that modern medicine has tended to overlook, passing on the other side of the road of many major community and social problems. We have tended, in our medical schools and hospitals, to deal especially with diseases found in our wards and have been lothe to go out to cope with, or even teach about, disease as found in the community.

With the appreciation that all is not well with the delivery of health services and with their ever rising costs, has come a feeling that too great a proportion of our national resources is being spent on research. With the increasing sophistication of medical knowledge and the growth of both clinical and laboratory specialisation and super-specialisation, have we tended to worship at the altar of research, to which many aspiring physicians annually make sacrifice? Are we devoting too much time, manpower and finance to pushing back the frontiers of knowledge at the expense of the effective implementation of knowledge already gained? These are weighty questions, difficult to answer.

In many spheres other than medical knowledge has outstripped application and there has recently been a revolt against research for research's sake, against what is called pure, basic or fundamental research.

In Great Britain, as elsewhere, there has been a demand for stricter control of money spent on research; the government wanting better, or different, value for its money. This has, of course, considerable appeal in many quarters, but must not be allowed to pass unchallenged. It is not possible clearly to distinguish between so-called fundamental and applied research and in general, the amount of money spent on medical research is very small indeed in relation to the total cost of health services. Should the increasing cost of health be financed at the expense of pure research?

I have no doubt myself that research must freely continue. It is, in fact, certain to continue. I believe that many great discoveries lie ahead and that they are only likely to be made, whether by concerted attack or by serendipity in an atmosphere of research Furthermore it is, I believe, essential that medical education should take place in such a questioning atmosphere of research if we are to produce doctors for tomorrow with a scientific and enquiring outlook, prepared for the major advances that will occur during their active careers. When we review the advances of the past fifty years, advances that have so revolutionised medical practice and care today, we cannot, dare not, deny the value of and need for research. We must continue to attract, train and retain many of our brighter intellects in the research field.

In 1968, on the occasion of the 20th birthday of the World Health Organisation, addressing the annual meeting of the Regional Committee for Europe, I did suggest that—"If, for the next twenty years, no further research were to be carried out, if there were a moratorium on research, the application of what is already known, of what has already been discovered, would result in widespread improvement in world health."

This was, needless to say, not a serious proposal, but I wished to emphasise my conviction that we were lagging behind and that we could, and should, be doing much more to improve health, especially in the developing countries, by making full use of present knowledge.

In medical research, as elsewhere, team work is increasing and more and more non-medical workers, biochemists, biophysicists, geneticists, engineers and computer experts are all deeply involved. It is no longer necessary to acquire a medical qualification in order to spend a life in medical research. Knowledge of the diseases of the ear, nose and throat, details of practical surgery or gynaecology or even child psychiatry does not make a man a better electron microscopist or a more skilled immuno-chemist. We need such scientists in medical research laboratories, but we owe it to them to ensure that they have a proper career structure, status and satisfaction.

While health statistics continue to improve, while infant mortality falls and expectation of life is prolonged, the demands on the health services show no diminution. The public, made ever more medically conscious by the press, radio and television, demands more medical care. How far are the demands made on the health services, the expressed want of the public, aligned with what we, in the medical profession, believe to be real needs or with what our governments decide that we can afford? How far can we impose what we, as doctors, feel to be for the public good; how far can we deny what the public demands?

What does the public want? First of all, I believe, good personal health care. The sick individual wants personal attention and care. Ideally he wants his own doctor to provide the ultimate in modern medicine while, at the same time, being sympathetic and alive to his social problems. The severely ill patient certainly wants hospital care, with expert team work to diagnose and treat him, but even here he wants his personal doctor who comforts, explains and reassures. With better organisation it should be possible to carry out many more investigations outside the hospital.

Inpatient care is increasingly expensive and many hospital beds could be saved by closer co-operation between general practitioners and the hospital services.

Our old, and the younger disabled patients do not want to lose their independence. They want, and need, much assistance, whether by nursing, by aids to daily living, by social services and community care, to maintain their independence and to postpone for so long as possible admission to a chronic hospital ward or hostel. There is an increasing realisation that it is possible to care for many mentally retarded patients or psychotics under treatment by modern drugs outside the barrack buildings of mental institutions. Here there is increasing community demands, but often inadequate evidence of community willingness to help.

The front line doctor, the doctor of first instance, the general practitioner, must be alive to these aspects of medicine; aspects that we have not, in the past, always taught to our medical students. A change of outlook is needed and yet we must continue to teach the modern complex aspects of medicine.

There is an increasing distinction between the work of the general practitioner and the doctor engaged in some super-specialty cardiac surgery, neurology or renal dialysis. Should we be training two different types of doctors? This may ultimately happen but, at the present time, it would, I feel, be disastrous and we must maintain the unity of medicine. The tendency today is to reduce the length of undergraduate training, appreciating that the chrysalis that replaces the student larva requires some years of postgraduate training before achieving the full flight and glory of the independently practising butterfly. The general practitioner is a specialist in his own sphere and, in the United Kingdom, we appreciate his need for two or three years postgraduate training.

The better delivery of medical care implies a demand on finance, manpower and time.

There are a number of ways of increasing manpower or of making better use of what we have.

An increase in the number of medical students would, in 8—10 years, increase the number of practising doctors. This implies either the admission of more students to each school with a resultant risk of lowered standards, or an increase in the number of medical schools. Both are taking place in many countries but they are expensive and neither will necessarily produce a breed of doctors willing to bring medical care to rural areas. In many developing countries an increased production of doctors trained on Western lines has led to an exodus of young men to countries where they can practice such medicine and can earn a better living, and the rural areas remain under-doctored.

In the developed countries it is the employment of such immigrants that is helping to solve medical manpower problems. The United Kingdom, the United States of America and Canada have depended for many years on such influx, but this cannot, in the long run, be an acceptable solution.

A small increase in the number of doctors practising in the community could be achieved by limiting the number able to pursue careers in research, but such a rationing or limitation of academic and research work would have very little impact on the manpower problem and, in the long run would, I am sure, be unacceptable and self-defeating.

This then raises the question how far the fully trained twentieth century scientific doctor, a very expensive product, is really required to deliver personal health care and how far we can follow the lead given by developing countries, making use of paramedical personnel working as a team. Time does not permit me to expand on this most important topic, but in the United States, Medical Aides, and in the United Kingdom Health Visitors and Nurses are lightening the clinical load on doctors within and outside the hospital, while health centres also facilitate and ease the work. The public, however, educated to want their personal physician, do not readily accept the need for such paramedical personnel.

Are the public now making excessive demands? The worries and frustrations of present day existence are perhaps reflected in the increased use of hypnotics, tranquillisers and pep pills and in the widespread pandemics of alcohol and drug dependence. Relieved of the fear of many diseases, yet assured of the importance of early diagnosis, the layman tends to call on his medical adviser with minor symptoms and worries.

The public still has a lingering belief in magic and has faith in every new treatment publicised by the press and yet fails to respond to medical advice on prevention. They continue to smoke cigarettes, developing carcinoma of the bronchus, chronic bronchitis and coronary disease and they resist the addition of fluoride to water supplies. Acceptance of these two suggestions would considerably lighten the work of the medical and dental professions.

There is a very real need, in both developing and developed countries, for health education, in schools and in adult life. Governments should encourage the spread of reliable information about family planning, nutrition, smoking and pollution by all available means This is clearly a need, but is certainly not, at the present time, felt to be a public want.

Health education made widespread immunisations possible and is slowly achieving an acceptance of family planning Efforts are now being made to popularise routine medical examinations and biochemical screening, but it is important not to oversell; not to press for their universal use until they have been fully evaluated and shown to improve life expectancy.

The history of the introduction of cervical smears was one of early pressure before full evaluation and general acceptance was slow. The possibility of carrying out routine biochemical surveys by autoanalysers does not imply a need for immediate introduction.

Who should ultimately determine health priorities? The public, the medical profession or the government? Finance for health services is limited, though there is no limit to demand. Who is to decide whether an expensive programme for renal haemodialysis, fulfilling a public and medical demand, produces more ultimate benefit than improved psychiatric care, or whether money is better spent on the latest equipment for the radiotherapy of cancer or in the provision of better hospitals and hostels for the mentally retarded. This clash between demand and possible supply has long been with us and will continue. The medical profession must be in a position to advise governments on the real needs of the community, while governments should be, but rarely are strong enough to resist the uniformed wants of the public. It is important that the medical voice should be heard in government circles and that medical advice should be regularly sought. It therefore behoves our profession to think on these problems, to discuss the planning of health services, the best allocation of limited financial resources and the best use of manpower so that considered and agreed opinion is available for government action.

In the final analysis, the wise patient trusts his doctor to give him what he needs and not what he wants. Will the public ever trust their government to do the same? *(Courtesy: Registrar, Royal College of Physicians, London)*

2

Mother's Milk and Other Home Foods

DERRICK B. JELLIFFE*

All societies have beliefs, rational as well as irrational, concerning foods and eating habits. Despite customs restricting the diets of children and pregnant women that one comes across in traditional societies, it can be said that most of these societies have, after thousands of years of trial and error, in a large measure adjusted to their environment and to the foods available.

Traditional diets as we know them today and those found in industrialised countries until recently, include certain almost universal components and combinations that have evolved in the course of the community's effort to survive. These basic food items were, and usually still are, grown near and prepared in homes. However, many of them tend to be undervalued in the modern world of technology.

Human milk heads the list. As would be expected with mammalian man, breast-milk has for countless generations been time-tested as the ideal food for infants, nutritionally and as a means of preventing infection. This view is supported by modern scientific knowledge of nutrition. But strangely enough, and as if man were incapable of comprehending the meaning of the radical biological change in the mother, breast-feeding began to decline in the western world in the present century. In the last few decades the fashion has caught on with the better-off classes in urban areas of developing countries and, even worse, continues to spread among the less well-to-do. It is surely strange that while scientists explore new and often seemingly improbable sources of protein, such as bacteria and pond weed, the most biologically adapted, consumer-tested home food for infants should tend to disappear through indifference and inadequate understanding.

The increasing lack of mother's milk, a naturally accessible and specially adapted food for young children, represents one of the major nutritional problems in the world today. Not only is breast-milk unique and impossible to imitate—despite manufacturers' claims—but the cost of cow's milk preparations also remains beyond the means of the average family in the developing world. At the same time, the level of home hygiene, including water supply and storage, makes it almost a certainty that what the artificially fed bably gets is a very dilute, contaminated feed. The result is the increasing incidence of diarrhoeal disease and marasmus in infants in subarban areas of the developing countries.

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If breast-feeding continues to decline steeply, a time must come when it will be necessary to consider alternatives and face problems of national finance, including shortage of foreign exchange. Means will have to be found to increase production of a protein-rich breast-milk substitute, possibly based on cow's-milk. If all the women in mainland Asia were to cease breast-feeding, an extra herd of 114,000,000 cattle would be needed to make good this loss.

All traditional human diets are based on *mixtures* of food in which the four main items usually are: the *staple*; *legumes*; *dark green leafy vegetables*; and *animal products*. At the core of all human diets is the staple or the "cultural superfood", around which ritual and life have thrived. The ancient Incas of the Andes worshipped the potato goddess, *Axomama*. The culture of the Baganda people of East Africa is completely intertwined with the plantain (*matoke*). In Europe until quite recently, wheat had a similar dominant position as the "staff of life".

The staple is the main source of calories and usually of protein as well. In most of the world it is a cereal such as wheat, rice , or corn (maize). Areas using these grains as staple are at a nutritional advantage, especially from the point of view of food for children, as cereals are not only good sources of "compact calories", but also contain more than 7 per cent protein. Other areas of the world, where tubers, such as yams, potatoes or cassava are the staple, are at a basic disadvantage, as these are low in protein (1 per cent) and even in calories, having a high content of water and of fibre.

Several varieties of legumes—that is, various types of peas and beans—form part of the standard diet of many communities. These are not only excellent sources of protein (20 per cent), but if eaten as cereal-legume "doublemixes" can supply the full range of basic ingredients of protein (essential amino acids) needed for survival just as well as such animal products as meat, milk or eggs. Some examples of these cereal-legume "doublemixes", which have evolved in the course of long experience with food in many ancient communities, are the corn *tortillas* and bean *frijoles* of Mexico, the rice and *dhal* (lentil sauce) of India, and the wheat (*burqhul*) and chick peas (*hommos*) of Lebanon. It is almost as if these home-prepared mixtures were based on a very advanced knowledge of nutrition.

In most parts of the world are to be found a variety of dark green leafy vegetables—spinach, sorrel leaves, manioc leaves, taroleaves—that can be considered as a traditional mineral and vitamin supplement, making good what is lacking in the basic cereal-legume doublemix. Many of these grow easily around the house or even wild. However, it is strange that all over the world, including Europe and North America, the use of leafy vegetables widely consumed earlier this century and easily grown in home gardens has diminished. Often they have been replaced by more expensive, less nutritious purchased vegetables—the anaemic lettuce, for example. In fact, some green vegetables may nowadays be considered old fashioned, or even weeds. One wonders if the remorseless pressure of the rising cost of living will—ironically primarily for non-nutritional reasons—make home gardens both necessary and fashionable again, even in the so-called affluent countries.

Animal products are excellent sources of protein containing the full range of essential amino acids, but for most cultures in man's history they have been difficult to obtain or too expensive. They have figured in the diet only on special occasions, with little significance in the general food pattern and much less in that of children. Greater encouragement is needed for the home rearing of culturally acceptable animal products, such as hen's eggs, guinea-pigs, fish and so on. This would not only augment the food supply but add an extremely important nutritional element to the local diet, and especially to the mixture of foods given to the child at the time of weaning.

We sometimes seem to forget that most people in the world have lived and are living largely on diets of mixed vegetable foods. Examination of the stomach contents of prehistoric people found preserved in the peat-bogs of Denmark showed them to have been eating mixtures of cereals, legumes and green leafy vegetables. Likewise, the nutritional value of many items eaten in European and North American homes is not fully appreciated. For example, the humble peanut butter sandwich of the USA and the beans-on-toast of Britain are both excellent cereal-legume doublemixes.

There should be better appreciation also of traditional dishes based on home-prepared multimixes containing all four main basic items. For example, the Italian *minestrone* represents a nutritionally and economically superb multimix, with the cereal in the form of wheat vermicelli and with small amount of animal product in the form of parmesan cheese sprinkled on top.

Nutrition problems vary from one region to another, but malnutrition in children in the first two years of life and in pregnant and lactating mothers is common almost everywhere. In numerous parts of the world, more than half of the children suffer from some degree of malnutrition, especially in the second year of life during the so-called weaning period; hundreds develop the severe and often fatal form, kwashiorkor. Malnutrition in this age group is mainly caused by lack of protein together with deficiencies in calories and other nutrients, including minerals and vitamins.

It has been estimated that there are at any time 10 to 20 million children in the world suffering from kwashiorkor or marasmus, both usually fatal if left untreated. Additionally, in the developing world as a whole, probably between one and two thirds of the 400 million children below five (or 10 per cent of the world population) are suffering from a malnutrition that is less dramatically apparent but shows its effects in a markedly diminished ability to withstand infections and in severe impairment of physical and mental development.

These problems have attracted much attention in recent years. There is no universal answer and the only logical approach is to discover the causes of malnutrition in a particular area and base programmes on that knowledge.

Malnutrition in children is associated with various factors existing simultaneously—for example, the nutritional ill-effects of infections (measles, intestinal worms, malaria and diarhoea), defective infant feeding, and lack of suitable foods. Other causes of malnutrition are poor absorption, adult-oriented feeding patterns (ill-cooked, indigestible food and half-meals), poverty, cultural restrictions on food for infants, or combinations of all these. Psychological factors may play a part. Sometimes poor appetite and vomiting are the result of "maternal deprivation", as when baby is suddenly separated from its mother at weaning.

Measures to improve the diet of children in a particular area must be based on knowledge of the traditional attitudes towards foods, of their distribution within the family and especially of methods of infant feeding. Quite often it is assumed that improved infant feeding depends on the distribution and/or sale of processed infant foods. No doubt, these foods serve a need in urban communities with a cash economy, but their cost and problems of preparation, packaging and distribution rule them out as a practicable solution to the problem of malnutrition in vast rural areas.

Most people in the developing parts of the world still live largely outside cash economies. Here, the emphasis must be laid on those foods normally eaten in the villages. Locally grown, prepared in the home within traditional dietary patterns, and improved, where necessary, by modern scientific knowledge, these foods can play their part in raising the nutritional level of families, especially that of the vulnerable young child.

Many multimixes prepared from home grown traditional items have received the endorsement of recent nutritional research. Some of them have been found particularly valuable as economical weaning foods. They can be prepared with the simplest kitchen equipment, and often the most useful technical assistance can be culinary epuipment supplied to a health centre—a small saucepan, spoons, a sieve, and so on.

Greater emphasis should be placed on the value of home gardens ("nutri-culture"), where with very little effort it is possible to grow leafy green vegetables, herbs, legumes and certain fruit trees. Convenience in matters of food is often seen as ease in taking it out of a can. The convenience of having a food plant adjacent to the house is often forgotten. In fact, some naturally growing foods are indeed "natural convenience foods" in that they are sterile, pre-packaged and can be used for infant feeding directly without cooking. These include the ripe banana, the avocado pear and the jelly of the unripe coconut.

Like so much else in modern life, technological achievements have been over-glamourised, while traditional, pragmatic wisdom tested in the natural laboratories of community living over thousands of years is disregarded or even categorised as old fashioned and "peasant ways of living". Many "new townsmen" in the shanty developments around tropical cities find themselves lost between two ways of living; they are without the land to grow traditional foods and without the knowledge to select or the income to purchase an adequate diet from often unaccustomed foods. In these circumstances, even a rising income may not lead to a better diet, as alternative consumer goods beckon, and "status symbol" foods may take precedence over those of nutritional value.

To improve the diets of children in areas where malnutrition is common, the appropriate use of both processed foods and home-prepared mixtures must be considered. In most of the world, however, malnutrition in early childhood caused by inadequate intake of protein and calories could be greatly reduced not by the extensive use of processed food mixtures but by scientifically exploiting what exists in, or adjacent to, the home—human milk in the first six months of life, and later home-prepared multimixes based on traditional foods, usually available in the village market or the home garden.

Such an approach to the problem of malnutrition requires a network of comprehensive maternal and child health services, adapted to local needs and resources, covering the whole range of curative and preventive activities, and manned by staff who understand home conditions, not only in theory, but also in practice. It is necessary to train all health staff in such a manner that they know the community and can truly appreciate the local reality. Home-visiting must be regarded as a most important component of health activities, especially for the purpose of practical, real-life nutrition education in the best use of foods at home. *(Courtesy: WHO)*

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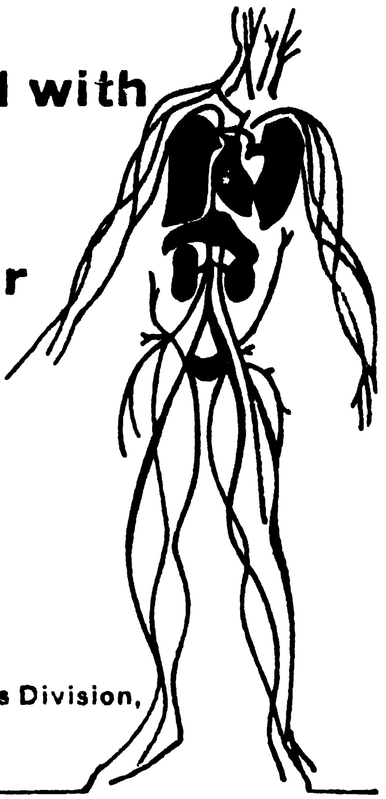

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* Grouber, U. F. "Volume Expansion and Flow Promotion in Shock" Postgrad. Med. J. (August 1969) 45, 534-538

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"Analysis of the data from the cross-over trial by the Wilcoxon matched-pairs signed ranks test shewed a clear superiority of Amitriptyline over the placebo in decreasing the frequency of nocturnal enuresis".

Abstracts of World Medicine Vol. 40 No. 1, July, 1966, Page 70.

AMITRIPTYLINE in the treatment of Enuresis in children

A double blind controlled clinical study of Amitriptyline and placebo in the management of children with enuresis was carried out. The drug administered for six weeks in a dose of 25 to 50 mg. given at bed time was found superior to placebo. The finding was statistically significant.

Amitriptyline in the treatment of Enuresis
Indian Pediatrics Nov.'71 Vol. VIII No. 11, Page: 767-69.

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— ADVANCE

NOTES AND NEWS

Retina Research Centre Opened

A well-equipped 40-bed Retina Research Centre of the Institute of Ophthalmology, Calcutta Medical College, was recently opened at a brief ceremony presided over by West Bengal's Health Minister, Mr. Ajit Panja.

Claimed to be the first of its kind in India, the centre is intended to promote diagnosis, treatment and research on different types of retinal diseases and to provide facilities for postgraduate studies for eye surgeons belonging to West Bengal as also to other States in Eastern India.

New Method to Cure Oral Cancer

A new method to cure oral cancer through transplanting of tissues evolved at the Government Royapettah Hospital, Madras, was highly commended by Dr. H. Voigt, an international cancer expert from Germany, who recently visited the hospital. Dr. Voigt was shown several interesting cases of oral cancer by the Superintendent, Dr. M. Narayanan, who had used surgery to deal with oral cancer. Dr. Voigt pointed out that surgery was the "number one weapon" to fight cancer, particularly oral cancer, when the disease could be localised. He felt that it should be possible to cure about 30 to 40 per cent of such cases provided these were detected sufficiently early.

Efficacy of Vitamin C in Treating Diabetes

According to the *Journal of International Research Communications*, Dr. Charles Daniel and Dr. Fred Dice of the Pharmacology Department of the Stanford University in U.S.A. have discovered that when large doses of Vitamin C are administered, the dosage of insulin required to maintain the sugar levels in the metabolism can be "substantially reduced".

Interestingly, Dr. Dice, a diabetic since he was 15 years old, was himself a subject of the experiments they conducted.

New Clue to Cause of Sterility and Infertility

A tiny organism, with similarities both to viruses and bacteria, may be the cause of sterility in some males and infertility in some females, according to two Swedish physicians—Dr. Haken Gnarpe and Dr. Jan Friberg.

The presence of the organism called T-Mycoplasma (TM) in husband or wife may be a possible cause for human reproductive failure.

Writing in the British journal *Nature*, they say that complete eradication of this organism from the childless couple could lead to the wife getting pregnant even after a long period of infertility.

The discovery that TM might be responsible for infertility is the result of a study in which the two doctors investigated 52 couples who were childless five years or even more after marriage.

A New Method of Heart Surgery on Babies

The freezing of babies during operations to repair heart defects has proved an effective technique for the Groote Schuur heart surgeons, with a success rate of almost 90 per cent, according to a report in the *South African Medical Journal*.

The report, written by Dr. Marius Barnard, brother of transplant pioneer Prof. Chris Barnard and Dr. T. J. Voss, describes work schedules carried out by the Groote Schuur hospital and the University of Cape Town since April last year.

"Since the technique of surface cooling was adopted by our unit, 13 patients have undergone surgery for congenital heart lesions. Eleven of these children were under the age of one year and under seven kgs., in weight and two patients were between the age of one and two years" say the authors. "Two patients died post-operatively," they report, "both of whom were complicated cases and in all probability unsuitable for complete corrective surgery". As to the technique they adopt they say, the infant is anaesthetised, on a cooling blanket and crushed ice in plastic bags is placed in contact with the skin at designated areas and continued until a temperature of 28°C is reached. They limit the time of circulatory arrest to 50 minutes.

After the heart repair is completed, the patient is rapidly warmed to a temperature of 32 to 34°C. The bypass is stopped and the operation completed.

"In our experience the heart has always started beating spontaneously moments after rewarming", says the report.

Blood Needs of Indian Hospitals

Indian hospitals requirements of blood for transfusion have been estimated at 4.25 million units of 250 c.c. each per year. This is based on a survey held by the World Health Organisation. The need of the Army, the Railways and private nursing homes has not been taken into account in arriving at the figure. However, the actual donations at present average only 2.5 to 3 lakh units.

Giving details of the incentives being provided by for donors Mr. A. K. Kisku, Union Minister for Health and Family Planning, informed the Rajya Sabha that voluntary donors contributed nearly 5 per cent of the blood collected. Constant efforts were made to appeal to the good sense and civic conscience of the people so that a large number of volunteers might be forthcoming.

Incentives of various types, such as medals, the grant of additional marks to students in annual examinations, special casual leave for blood donors, extra diet to prisoners and the remission of their sentence, etc., had been suggested to State Governments for their consideration, he added.

Breakthrough in Breast Cancer Treatment

Hospital trials with a new drug, a powerful anti-oestrogen, developed by a leading British chemical industries firm under the trade-name Tamoxigen, have shown remarkable results in the treatment of breast cancer, reports the *British Medical Journal.*

According to Dr. H. W. C. Ward, consultant radiotherapist at Queen Elizabeth Hospital, Birmingham, 68 women with advanced cancer of the breast were treated with the drug in two groups. One group of 33 was put on a dose of ten milligrams of Tamoxigen twice daily and twelve of them showed definite response, eight responded partially their tumour becoming smaller and secondary growths disappearing.

The second group of 35, on being given a double dose showed better results. Side effects of Tamoxigen are minimal, according to Dr. Ward.

Eye-treatment with Laser Beam

Researchers at Stanford University, under a grant from the U.S. National Institutes of Health, have invented a device for safely treating the eye with a laser beam. The process is called laser photocoagulation. It may be used to treat retinal detachments, destroy tumours, prevent the spread of disease and for other purposes.

The apparatus focuses the laser's intense energy on a carefully selected part of the eye, for eye tissue is destroyed by photocoagulation. The equipment, which includes a slit lamp or binocular optical viewing instrument, keeps the beam in accurate focus and controls the spot size.

The machine is produced by Coherent Radiation Laboratories, of Palo Alto, California.

Smoking Pill

A pill, which not only kills the chain smoker's craving to smoke but also helps him improve his appetite and health, has been developed in Bulgaria

The pill, known as "Tabex", is prepared from extracts of *cytisus laburnum*—a common plant found in Bulgaria. Since time immemorial decoction of the seeds of this plant has been used there to normalise the breathing of newborn babies.

The pill was put to test recently in two research institutions in Sofia. The groups used for the test included tobacco addicts who had been smoking for 15 years to 25 years. After 25 days' medical treatment (during which the patients had to take 100 Tabex pills according to a special schedule), only nine per cent continued smoking, while 60 per cent completely stopped smoking and there were 31 per cent who smoked "normally". At the end of the treatment, most of the smokers even lost their chronic bronchitis.

WHO Travellers' Guide on Malaria

World Health Organisation doctors have published what they consider to be the first comprehensive guide defining a traveller's risk of getting malaria in all countries.

WHO experts estimated in an interview at Geneva that each year several thousand people become ill from malaria after returning home from foreign travel.

Despite malaria's importance in public health, travellers, travel agents and doctors until now had no reference text to learn specifically where malaria occurs. They had to rely on a WHO map that vaguely outlined the dangerous areas.

Now by consulting the WHO guide, a doctor or traveller can learn just where malaria exists in any country on the itinerary.

The guide indentifies those months when malaria is spread, the altitude levels below which the risk exists, and those urban areas where a tourist can spend a night without the threat of getting malaria.

However, WHO doctors such as Dr. Gabriele Gramiccia who prepared the guide, point out that the tourist must remember that he can still get malaria if he is bitten by just one infected female anopheles mosquito during a visit of just a few hours at night in a rural area outside the malaria free city. These mospuitoes prefer to bite at night.

School of Tropical Medicine, Calcutta Admission in D. C. P. Course

The one-year course of instruction for Diploma in Clinical Pathology under the Faculty of Tropical Medicine and Hygiene, West Bengal, will begin on 2nd July, 1973. The course is open to medical graduates or candidates possessing equivalent qualifications with at one year's experience as House Medical Officer or Pathologist in a recognised institution. Applications for admission in the prescribed form (obtainable from the office) should reach the Director, School of Tropical Medicine, Chittaaranjan Avenue, Calcutta 12, by the *31st May, 1973.*

CORRESPONDENCE

The Editor is not responsable for the views expressed by correspondents

Passing of Capsules with Faeces

SIR,—This has reference to a letter of Dr. K. N. A. Rao, Professor of Microbiology, Kasturba Medical College, Manipal, entitled 'Passing of Capsules with Faeces' published in your esteemed Journal (*J. Indian M.A.*, 60: 70, 1973).

Prof. Rao has expressed anxiety about Drug Controller Department's lack of strict control on quality of drugs. I feel, the patients' need could be best served if the consumers take up such cases in their hands. For instance, in this case Prof. Rao could have named that particular brand of B-Complex, its manu-

facturer's name, etc., so that we could stop prescribing it without having to wait for an order from the Drug Controller.

I am, etc.,
26/5 Rajpur Road J. N. KALHAN, M.S., F.R.C.S.
Dehra Dun, U.P.

An Appeal to Graduates from Medical College, Baroda

SIR,—The Medical College, Baroda, Gujarat is completing 25 years. On the occasion of its Silver Jubilee, I wish to compile a directory of those who have graduated from this college. I also wish to study the trends of the graduates from this college in relation to the speciality they have taken, their postgraduate education, overseas visits and other social aspects.

The graduates of Medical College, Baroda are settled in different parts of the country and I take this opportunity to contact you through the wide readership of the *Journal of The Indian Medical Association*. Please send me at the address below your name and address so that I can send the questionnaire. I seek your cooperation in this challenging but interesting work.

I am, etc.,
Medical College and S. S. G. Hospital
Baroda, Gujarat
ROHIT V. BHATT, M.D. (Bom.), D.C.H.
Professor and Head of the Department of Obstetrics and Gynaecology

REVIEWS

Tropical Sprue and Megaloblastic Anaemia—By Wellcome Trust Collaboratory Study (1961-69), 1971, Churchill Livingstone, Edinburgh and London, 23.8 cm. × 15.5 cm., pp. xii + 318, £ 4.75 in U.K.

This collaborative study on tropical sprue in different parts of the world has shown, in general, the similarities of the various symptoms and signs of the disease. The aetiology of this disorder is still unknown. Folate deficiency is commonly found which is demonstrated by response to therapy. In South India, cases differ slightly as B_{12} deficiency predominates more often than folate deficiency. Sprue cases are studied thoroughly as far as possible in different centres showing various haematological and biochemical changes. Radiological and histopathological changes of small intestine have demonstrated extension of mucosal changes occur from jejunum to ileum with a long continued course more than 3 months.

This collaborative study by eminent research workers in different medical centres of the world organised by Wellcome Trust will be welcome by research workers in this field of research.

R. N. RAY

Anaemia—By B. C. Mehta, 1971, The Indian Journal of Medical Sciences, Bombay 4, 24.5 cm. × 16.8 cm., pp. viii + 90, Rs. 15.00

This book though small has dealt with the subject of anaemia in a concise but useful way. It will be worth reading for medical students and general practitioners.

R. N. RAY

Preventive and Social Medicine in India—By B. K. Mahajan, 2nd edition, 1972, Jaypee Brothers, Delhi, 21.5 cm. × 14 cm., pp. xiv + 772, Rs. 30.00

In recent years textbooks on "Preventive and Social Medicine" have been published in India and this textbook is one of them.

The second edition has been edited by B. K. Mahajain in a decent way. It covers all the chapters of preventive and social medicine as required by undergraduate students. It has covered curricula of various universities of India.

The book has been divided into three sections. Section I covers environmental sanitation and hygiene. Section II covers the epidemiology of diseases. Section III covers statistics and public health administration. To me it seems that all students and teachers of preventive and social medicine will find this interesting. Chapter 21 on biostatistics is superb and undergraduates will learn much.

Chapter 29 on geriatrics is a new introduction for undergraduates so that they may know about social problems in old age.

This book is recommended for undergraduates in medicine and other public health workers. If the book is moderately priced it may find a large readership.

M. M. GANGULY

Radiation Protection Instrumentation and Its Application *(ICRU Report 20)*. International Commission on Radiation Units and Measurements, 1971, 7910 Woodmont Avenue, Washington, D.C. 20014, U.S.A., 21 cm. × 27 cm., pp. viii + 60, $ 3.50.

Radiation Protection Instrumentation and Its Application published on October 1, 1971, constitutes the Report 20 of ICRU. This, perhaps, is in recognition of the fact, as stated in the preface, that since single volume publication is too extensive and too specialised, publication of a series of reports each dealing with a limited range of topics is more appreciated. The present, ICRU report 20 is one such. It starts with a brief introduction and the report has been presented in four sections. The first of these sections begins with a basic discussion of radiation quantities and units, of the interpretation of instrument readings in terms of such units stating briefly the accuracy usually required. This is followed by a section under the heading 'Instrument Characteristics' which deals with various types of radiation detector, concentrating particularly on their characteristics and mentions useful references for their description and operation. The choice and use of instruments are next presented in four subsections dealing respectively with 'sealed gamma-ray sources and sources of x-rays and electrons; unsealed radioactive sources; reactors and sealed neutron sources; and charged particle accelerators'. Most of the material on gamma-ray and x-ray instruments will be found in the first part, that on 'alpha-ray and beta-ray instruments used for evaluating contamination 'in the second and' material on neutrons up to 20 MeV' in the third. 'Special consideration important for the higher energy ranges' are incorporated in the fourth part. A separate section has been devoted on 'monitoring instruments for individuals'. The report ends with a useful discussion of calibration procedures. Finally, in the Appendix useful information have been provided on 'Thermal Neutron Instruments' and 'Dose Equivalent Instruments'.

Besides, the report covers a list of useful references pertinent with radiation work and also a list of reports published so far by ICRU. The report is well organised and the presentation throughout is commendable and is strongly recommended to all those engaged in radiation works.

BIJON ROY

Handbook of Leprosy—by W. H. Jopling, William Heinemann Medical Books Ltd., London, 1971, pp. 5 + 91, 20 colour plates, 15 figures and 5 tables, 22 cm. × 14 cm., £ 1.20 net.

This handbook contains the recent and current information about leprosy so that a better understanding of intricate problems is made. The reference at the end of each chapter is helpful to those who may like to be educated more. The get-up of the book is nice and easy to read. This book is worthy of possession.

S. GHOSH

An Approach to the Study of Leprosy—by A. V. Saoji, Payal Prakashan, Nagpur, 1972, pp. 10 + 108, 21.8 cm. × 13.8 cm., Rs. 12.00

In this little book the author has presented different aspects of leprosy in 10 sections with eloquent phrases. Attempts have been made to explain complicated matter with diagram. Photographs has also been included but hey are not all too good. It is easy to read as it has been written in a simple way. This book will be useful for those who want to know about leprosy.

S. GHOSH

Immunology for Undergraduates—By D. M. Weir, Second Edition, 1971, Churchill Livingstone, Edinburgh and London, 18.7 cm. × 12 cm., pp. 10 + 158, 80p (UK)

This book provides an account of the vast knowledge of immunology within 150 pages. The author has made an effort to accommodate a host of information in this limited space. In most of the places disjointed facts have been pulled together with very little explanatory notes. I am afraid, for the beginner it will be quite difficult to understand the subject even by repeated reading. For those who already know the subject, this book will serve the useful purpose for revision.

B. LAHIRI

OBITUARY

Dr. M. M. Nanavati

Born in 1901 at Junagadh, Gujarat, Dr. M. M. Nanavati graduated from Grant Medical College, Bombay in 1926. He enrolled for his M.S. under late Dr. Mulgaonker, but due to the pressing need of the family had to discontinue the study. He settled down in Kutiyana near Saurashtra and started private practice.

DR. M. M. NANAVATI

A staunch nationalist Dr. Nanavati worked for the upliftment of Kutiyana town and surrounding villages. During the difficult year of 1947-48 he devoted himself to the preservation and security of this region. Later, he made his debut in the field of Panchayat activities and practically laid the foundation of Kutiyana Nagar Panchayat for which he raised funds besides giving it his guidance and working for its progress.

Though wedded to the cause of the welfare of Kutiyana town Dr. Nanavati practiced medicine and surgery with rare devotion and skill. His advice both in the sphere of medical and social problems was equally valued. He was honoured by the Government of Gujarat State by conferment of the title of J.P. for Kutiyana town.

Dr. Nanavati was an active member of the I.M.A., Porbandar Branch. He passed away on 8-2-73 at the age of 72. He is survived by his wife, three sons and two daughters.

SUPPLEMENT

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

VOL. 60, No. 7 CALCUTTA APRIL 1, 1973

Association Notes

XIV-I.M.A. Study Tour to U.S.A., Europe and U.K. May 17 to June 14, 1973

Announcing details about the XIV—I.M.A. Study Tour to U.S.A., Europe and U.K. to begin from May 17 next, Dr. P. C. Bhatla, Hony. General Secretary, I.M.A., states in course of a circular to the Hony. Secretaries of all Local Branches and State/Territorial Faculties of I.M.A. College of General Practitioners:

1. The Indian Medical Association/I.M.A. College of General Practitioners take pleasure in announcing the XIV-I.M.A. Study Tour to U.S.A., Europe and UK, giving the opportunity to the participants to visit Medical Institutions/Hospitals and to meet colleagues in different countries to share experience and exchange views on current medical topics.

2. The relevant information about the tour is given below:

(i) *Eligibility:*

The participation in the tour is open only to those who are members of the I.M.A. College of General Practitioners for six months or over. Their families may accompany them. Preference will be given to Fellows and Life Members of the College.

(ii) *Registration:*

The registration of participants will be on "first come first served" basis on receipt of application in prescribed form and a *bank draft* of a deposit of Rs. 200/- per person (Rs. 400/- in the case of a couple). (This amount is not refundable unless an eligible substitute is given before April 10, 1973).

(iii) *Cost of tour:*

The cost of the tour is Rs. 7,000/- plus US $75 per person ($75 for the tour of Europe only) payable as follows:

(A) Out of Rs. 7,000/-, Rs. 200/- with the application for registration and the balance of Rs. 6,800/- by *April 16, 1973.*
(All payments by *bank drafts* or in *cash*. No cheques will be accepted).

(B) $75 on start of tour.
This cost includes:

(a) Air fare from India and back to India;
(b) Government of India Foreign Travel Tax;
(c) Airport and Local Taxes;
(d) Visa charges (Visa forms will be sent to the participants after their registration).
(e) I.M.A. Headquarters administrative expenses;
(f) Hotel accommodation in double rooms (with all meals in Cairo, Frankfurt and Geneva and with Continental Breakfast only in Paris and Vienna). Accommodation in London and New York are not included in the cost.
(g) Sightseeing with English-speaking Guide in Cairo, Rome, Vienna, Frankfurt, Paris and Geneva.
(h) Transfers on arrival and departure from airport to hotel and vice-versa in Cairo, Rome, Vienna, Frankfurt, Paris and Geneva.
No such arrangements at London and New York.

The excursion fare Delhi-New York-Delhi or Bombay-New York-Bombay is Rs. 4,004/- plus Foreign Travel Tax of Rs. 401/-=Total Rs. 4405/- per person. This does not, however, include other expenses such as airport tax, visa fees, transportation from airport to hotels and back, sight-seeing charges, visits to hospitals etc.

Also, the excursion fare of Rs. 4405/- does not allow the passenger to break the journey anywhere on the outward journey to New York and return from New York to India, which means that no cities/countries in Europe or Middle-East can be visited on this fare. Under no circumstances, an exception could be made as Air-India does not allow the passenger to break the journey enroute, i.e. on way to New York or return to India from New York. *Under the excursion fare clause, the passenger must travel direct from India to New York and back.*

Under the fare of Rs. 7,000/-, the participants can visit a number of cities in Europe and Middle-East both ways. The maximum permissible number of cities in Europe and Middle-East, have thus been included in the above fare.

(iv) *Itinerary:*

The tour itinerary is as follows:

May 17, 1973	Lv. New Delhi	0825 hours	AI-127
	Ar. Cairo	1220 hours	
May 18, 1973	Lv. Cairo	0800 hours	AZ-891
	Ar. Rome	1125 hours	
May 19, 1973	Lv. Rome	0935 hours	OS-272
	Ar. Vienna	1100 hours	
May 20, 1973	Lv. Vienna	0730 hours	OS-401
	Ar. Frankfurt	0845 hours	
May 21, 1973	Lv. Frankfurt	0830 hours	AI-101
	Ar. New York	1535 hours	
June 5, 1973	Lv. New York	2000 hours	AI-104
June 6, 1973	Ar. London	0740 hours	
June 11, 1973	Lv. London	0930 hours	AI-116
	Ar. Paris	1135 hours	
June 12, 1973	Lv. Paris	1630 hours	AF-670
	Ar. Geneva	1725 hours	
June 13, 1973	Lv. Geneva	1420 hours	AI-104/127
June 14, 1973	Ar. Delhi (*Via* Bombay)	0700 hours	

(v) *Side tour of USA and Canada:*

Arrangements have also been made for a 7-day Optional Tour starting from New York, visiting Philadelphia, Washington D.C., Niagara Falls, Toronto, Rochester, Boston, and ending in New York. This is an Optional Tour for those who wish to join. Its cost is as follows:

Minimum of:

	10 Persons/	20 Persons/	30 Persons/	40 Persons
Per person	US$218/	US$160/	US$128/	US$119/

The cost of this tour will have to be paid in New York in foreign currency. The exact amount to be paid by each participant will depend on the number of persons registered for it. It will, therefore, be intimated to participants after registration.

The cost of this Optional Tour in USA and Canada includes:

(a) 6 nights accommodation without meals;
(b) Transportation by private airconditioned coach throughout USA and Canada as per the itinerary;
(c) Sight-seeing of each city with English-speaking Guide;
(d) Baggage handling at hotels.

Further details will be advised later.

State Medical Conference

XXV Gujarat State Medical Conference
Palanpur : 1972

The 35th Annual Conference of the Gujarat State Branch of I.M.A. was held on April 28-30, 1972, at Palanpur. About 350 delegates and visitors from all over the State attended the conference.

On 28-4-72 under the chairmanship of Dr. H. L. Sheth the meeting of the State Council took place with nearly 55 representatives present. After disposal of the routine business the council considered the annual report, accounts for the year 1970-71 and also the budget for the year 1972-73, which were approved after some discussion. The progress in membership strength and the satisfactory working of the local branches in the State were appreciated. The council meeting terminated with a vote of thanks to the Reception Committee for its excellent arrangements and hospitality in spite of several difficulties.

The Council also passed a vote of thanks to the outgoing President, Dr. H. L. Sheth for his very able guidance to the State Branch. The President in return thanked all the members of the Working Committee, members of the Sub-committees and the members of the State Council for their kind co-operation during his tenure.

The inaugural session commenced on the morning of 29-4-72. At the outset Dr. H. N. Trivedi, Chairman, Reception Committee, welcomed the chief guest, the delegates and visitors and other invitees to the conference and traced the history of Palanpur and the Palanpur Branch of I.M.A., which was a small but an active local branch of I.M.A. in Gujarat.

Dr. K. M. Bhanshali, a native of Palanpur and one of the very senior and eminent physicians of Bombay, inaugurated the conference. Addressing the members and the delegates Dr. Bhanshali stressed the need for medicalmen to keep themselves fully conversant with the developments in the medical science. He also urged them to treat their profession as a means of service to the nation.

Dr. B. P. Shah, Vice-Chairman, Reception Committee, read out the messages received on the occasion wishing the conference a sucess. Following this Dr. H. L. Sheth, outgoing President, installed the President-elect Dr. R. L. Shah in the presidential chair.

Dr. R. L. Shah, thanked the members for electing him to the high office of the President of the State Branch for the year 1972-73. In course of his presidential address he examined some of the burning problems before the medical profession including the national rural health scheme quackery, payscale of doctors in service, medical education, etc. He particularly drew the attention of the State Government to the inadequate staff in many Government hospitals and non-availability of life-saving drugs. He said Government should take urgent steps to meet the crisis. Dr. Shah complimented the State Government on its outstanding achievement in Family Planning campaign by performing 2,37,000 vasectomy operations in course of eight weeks.

Speaking on the occasion Dr. V. H. Thakore, Director of Medical and Health Services, Gujarat, who was present [illegible]hief guest, stated that all necessary measures were being taken for improving the health and medical services in the State. He said that the relation between the Gujarat State Branch of I.M.A. and the Health Department, Government of Gujarat had always been cordial in the past and as a result a good co-operation was maintained between the Government and the medical personnel of this State in all projects undertaken by the Health Department. He hoped the I M.A. members would continue to extend their cooperation in future.

Shri Shirish Modi, President, Palanpur Municipality, thanked the organisers for giving him an opportunity to meet a large number of medicalmen of Gujarat, who had assembled at this historial city. He appealed to the delegates to review the health problems of the Banaskantha District and give their valuable suggestions.

RESOLUTIONS

The following resolutions were passed at the 25th Gujarat State Medical Conference at Palanpur:

I. This conference deeply mourns the sad demises of the following members:

1. Dr. G. B. Mankad. (Ahmedabad); 2. Dr. R. A. Patel (Ahmedabad); 3. Dr. B. B. Oesai (Ahmedabad); 4. Dr. Kavina K. D. (Surat); 5. Dr. (Mrs.) V. O. Jalan P. P. Sheth (Ahmedabad); 8. Dr. H. M. Desai (Ahmedabad); 9. Dr. M. B. Pandya (Mehmedabad); 10. Dr. P. Sing Roy (Rajkot); 11. Dr. H. N. Bhatt (Gandhinagar); 12. Dr. A. R. Shukla (Bulsar); 13. Dr. R. M. Bhatt (Baroda); 14. Dr. H. D. Sanghavi (Morvi); 15. Dr. S. B. Dhruv (Ahmedabad); 16. Dr. N. B. Mazumdar (Junagadh).

II. This conference resolves that medical licenciates in Government, semi-Government, Panchayat and other services having more than ten years standing be upgraded from class III to Class II.

III. This conference resolves that medical licentiates having standing of ten years or more be taken up in L.I.C., Universities and similar bodies in class II cadre.

IV. This conference resolves that with a view to promote child health and reduce morbidity of infectious diseases which take heavy toll of lives, Government is requested to take up mass immunisation programme, more vigorously throughout the State and wide publicity for immunisation programme should be given through the Government Health Education and Publicity Bureau.

V. This conference reiterates its resolution No. IV passed at the XXIII Annual Conference held at Broach which reads as under:

"This conference expresses its deep concern at the overcongestion in the hospitals run either by the State or the local bodies and snggests and requests the authorities concerned to appoint a committee of experts including a representative of I.M.A., Gujarat State Branch, to find out ways and means to evolve a scheme to obviate such congestion in these hospitals and facilitate more admission in them of the needy and the poor and also consequently to minimise the expenses and maximise the efficiency of these hospitals".

VI. This conference reiterates the resolution No. V. passed at the XXIII Gujarat State Medical Conference held at Broach which reads as under:

"This conference expresses its deep concern at the dearth of services of qualified General Practitioners in modern system of medicine in the rural areas and offers such services in the rural areas on part-time appointment at remuneration to be arrived at by joint consultation between Gujarat State Branch. I.M.A. and the State Government. This will ease the problem of the Government for attracting doctors in the rural areas. This conference strongly recommends re-employment of retired qualified persons in modern system of medicine in the rural areas, provided they are physically and mentally fit".

VII. Whereas, the Medical Termination of Pregnancy Act has come into force in our country from April, 1972, and whereas this Act is considered a welcome piece of legislation by I.M.A. from various points of view.

This conference submits the following for immediate consideration by the authorities concerned:

1. To furnish immediately the Rules and Regulations and other relevant details to the I.M.A. Gujarat State Branch.
2. To immediately form the State Board for laying down guidelines in connection with this Act.
3. To seriously consider hazards of abortion and link up sterilisation following the abortion as a Family Planning measure.

VIII. This conference is of the opinion that the diaparity in the age of retirement between the service and the honorary doctors should be abolished forthwith.

Branch Notes

ANDHRA PRADESH STATE BRANCH

Srikakulam Branch — The annual meeting was held in the District Medical and Health Office, Srikakulam, on 9-10-71. Dr. K. Raghavendrarao took the chair.

The following were elected office-bearers for 1971-72:

President—Dr. K. Raghavendrarao ; Vice-President — Dr. T. Jogarao ; Hony. Secretary—Dr. C. V. Raja Reddy ; Treasurer—Dr. S. Chittibabu.

Later Dr. C. Vyaghresvarudu, Professor of Orthopaedics, Andhra Medical College, Visakhapatnam, spoke on Treatment of Common Fractures and Dislocations.

BENGAL STATE BRANCH

Andul Branch—Members of the branch volunteered their services for extending relief to the people of the surrounding areas which were inundated by the devastating floods. Six relief centres were started, out of which 4 centres opened at Abada, Mohiary Kundu Gardens, Mourigram Station and Nalpur undertook medical treatment of the affected people under the leadership of Dr. S. Ghosh, Dr. J. Ghosh and Dr. B. Pal. These centres catered to the needs of about 700 patients besides inoculating 900 people against cholera. The branch received generous help and co-operation from all quarters in its relief activities.

Asansol Branch—The annual general meeting was held on 29-10-71. The Hony. Secretary, Dr. Sisir Kumar Kundu presented the annual report for 1970-71. He stated in his report that the Scientific Sub-committee of the branch arranged two symposia during the year, one on Misuse of Antibiotics and the other on Diabetes Mellitus. By courtesy of M/s Suhid Giegy Ltd. scientific films were screened for the benefit of the members. The Entertainment Sub-committee arranged the annual picnic at Bakreshwar on which occasion about 60 doctors along with their families participated. A badminton match and a cricket match were also arranged. The Building Sub-committee opened negotiations for the purchase of a plot of land on Burnpur Road for the Association building.

The membership of the branch rose from 119 to 136 during the year. The branch observed the World Health Day on 7-4-71 when popular lectures were delivered by Dr. K. Sengupta and other members of the branch on the theme of the day "A Long Life Despite Diabetes". The members observed "Doctors in Employment" Demands Day on 1-9-71 by wearing badges, holding press conference, observing one hour's cease work both in hospitals and private clinics excepting emergency cases and presenting a memorandum of the Association to the Prime Minister of India through local S.D.O. A meeting was jointly organised on this occasion by I.M.A's. Asansol, Ranigunj, Jamuria and Chittaranjan branches. Dr. K. K. Das of the State Branch addressed the meeting. The branch contributed medicines, transfusion materials and surgical dressing for the freedom fighters of Bangladesh *through a local relief organisation. It also collected* Rs. 2091/- besides medicines, *protein food and trans*fusion materials worth Rs. 6000/-, out of which it donated Rs. 2060/- in cash and handed over the stock of medicines and other materials to the State Branch of I.M.A.

The above report as placed by the Hony. Secretary was adoped. The election of office-bearers for the year 1971-72 then took place as follows:

President—Dr. P. K. Banerjee; Vice-Presidents—Drs. D. P. Ghose, S. C. Mitra, S. K. Ghatak and J. N. Sharma ; Hony. Secretary—Dr. Sisir Kundu; Jt. Secretaries—Drs. Sudhin Roy, B. K. Chatterjea and M. C. Mukherjea ; Representatives to State Council—Drs. Sisir Kundu, G. R. Mitra, M. C. Mukherjea, S. Banerjea and S. K. Ghatak ; Representatives to Central Council—Dr. B. K. Rai Choudhuri and Dr. L. Roy.

Bagnan Branch—At the annual general meeting the following were elected office-bearers for 1971-72:

President—Dr. Gopi Krishna Chakravorti ; Hony. Secretary—Dr. Sib Krishna Chakravorti and Dr. Rabindra Nath Roy ; Representative to Central Council—Dr. Gopi Krishna Chakravorti.

Balagarh Branch—At the annual general meeting the following were elected office-bearers for 1971-72:

President—Dr. Anil Kr. Ghose; Vice-Presidents—Dr. Santosh Kr. Roy and Dr. Biswanath Sen; Hony. Secretary—Dr. Kalipada Bandopadhyay ; Treasurer—Dr. Sourindra Nath Sen ; Representative to State Council—Dr. Kalipada Bandopadhyaya.

Batanagar Nangi Mahestola Branch—The following were elected office-bearers and members of the executive committee for the year 1971-72 at the annual general meeting held on 31-10-71:

President—Dr. Ashutosh Paul ; Vice-President—Dr. A. N. Roy ; Hony. Secretary—Dr. A. B. Basu (Swaraj) ; Assistant Secretary—Dr. S. C. Mitra ; Treasurer—Dr. B. C. Mitra ; Members of the Executive Committee—Drs. Milan Kumar Mukherjee, Kamada Kanta Paul, Ranendra Kumar Bagchi, Amar Nath Paul and Ashutosh Mukherjee; Representatives to State Council—Drs. A. N. Roy, A. B. Basu (Swaraj) and S. C. Mitra; Representative to Central Council—Dr. A. B. Basu (Swaraj).

Chandernagore Branch—The annual general meeting was held on 24-10-71 at the Institute De Chandernagore.

The branch organised an obstetrical and gynaecological convention on 14-11-71. Dr. R. G. Nandy, President of the branch, took the chair. Dr. S. Sett, convenor, welcomed the gathering. Sri I. Chaudhuri, District Magistrate, Hooghly, inaugurated the convention with a sutiable speech. Prof. K. C. Karmakar, Deputy Director of the Institute De Chandernagore, was present as Chief Guest. Dr. K. M. Gun, Joint Secretary, Bengal Obstetrical and Gynaecological Society thanked the organisers for holding the convention, second of its kind, the first one having been held at Durgapur. Dr. M. M. Dutta, gynaecologist, Hindusthan Steel Plant, Hospital, Durgapur, explained the causes of bleeding in early months of pregnancy and its management. Dr. K. M. Gun, Assistant Professor, Department of Obstetrics and Gynaecology, N.R.S. Medical College, Calcutta, dealt with the bleeding in later months of pregnancy. Dr. N. N. Roy Choudhury, Reader, Department of Obstetrics and Gynaecology, R. G. Kar. Medical College, explained the use of culdoscope in modern gynaecological practice with the help of slides. Dr. S. Sett presented a case of septic embolus from the uterus carried via bloodstream to one of the eyes causing panophtahlmitis within 6 to 8 hours. Dr. S. Mondal spoke about chemotherapy in late cases of gynaecological cancers. Dr. R. N. Pal, Hony. Treasurer and Dr. B. K. Pramanick, Hony. Secretary were all attention to the guests, who were entertained to lunch by the branch and the Press Club, Hooghly.

Chittaranjan Branch—The following were elected office-bearers for the year 1971-72:

President—Dr. A. K. Das Gupta ; Vice-Presidents—Dr. C. M. Dutta and Dr. S. K. Chatterjee ; Hony. Secre*tary—Dr. H. B. Tapadar ; Secretary—Dr. S. Bhattacharya; Treasurer—Dr. A. Maitra; Auditor—Dr. S. Bando*padhyay; Representatives to State Council—Dr. J. Lahiri and Dr. M. C. Sarkar; Representative to Central Council —Dr. (Mrs.) S. Mehta.

Contai Branch—The annual general meeting was held on 17-10-71 with Dr. R. D. Pal in the chair. Presenting his annual report the Hony. Secretary urged the members to work whole-heartedly for implementing the programmes of the Association in the interest of both the medical profession and suffering people. He also gave a brief report of the successful observance by the branch of the All-India "Doctors-in-Employment" Demands Day on 1-9-71 in co-operation with the medical staff of the sub-divisional hospital and health centres.

A number of resolutions was passed in the meeting. In a resolution the meeting expresed serious concern over the rising incidence of water-borne diseases in this sub-division and demanded strict enforcement of public health measures along with an early provision of filtered water supply. The resolution also urged the Contai municipal authorities to immediately resuest the chief medical officer of Midnapore to take necessary steps in order to strictly enforce the Indian Drug Rules. Welcoming the proposals of the State Branch to convene a rural health convention and a general practitioners' convention, the branch recommended observance of a week-long programme throughout the State to highlight the worsening working conditions under which general practitioners of both rural and urban areas were carrying on their practice. The branch also requested the State Branch to consider holding of the meetings of State Council and the Working Committee in mofussil districts and arranging refreshers course at district and sub-divisional levels.

The following were elected office-bearers for the year 1971-72:

President—Dr. R. B. Paul; Hony. Secretary—Dr. J. C. Giri; Representative to Central Council—Dr. Subodh K. Maity.

Darjeeling Branch—At a general meeting the following were elected office-bearers for 1971-72:

President—Dr. S. N. Chatterjee; Vice-President—Drs. R. N. Adhya, H. C. Bagchi and J. K. Ghose; Hony. Secretary—Dr. B. Kusarye; Jt. Secretaries—Dr. Amal Kumar Chaudhuri and Dr. G. P. Ojha; Treasurer—Dr. Tinkari Chatterjee; Representative to Central Council—Dr. B. Kusarye; Representatives to State Council—Dr. B. Kusarye and Dr. R. N. Adhya.

Garden Reach Branch– At the annual general meeting held on 17-10-71 the following were elected office-bearers for the year 1971-72:

President—Dr. L. N. Chatterjee; Vice-Presidents—Drs. H. D. Koley, Hrishkesh Pal and P. K. Roy; Hony. Secretary—Dr. P. B. Das; Assistant Secretary—Dr. Moni Mohan Das; Treasurer—Dr. H. R. Kundu; Executive Committee Members—Drs. B K. Kundu, P. Bose, A. B. Roychowdhury, K. K. Pal, Pramanick, N. C. Mukherji, K. K. Bose and H. K. Pal; Representative to Central Council—Dr. K. K. Bose; Representatives to State Council—Drs. L. N. Chatterji, P. B. Das and K. K. Bose.

Kharagpur Branch– At the annual general meeting held on 22-9-71 the following were elected office-bearers for 1971-72:

President—Dr. S. K. Mitra; Vice-President—Dr. H. K. Guha; Hony. Secretary—Dr. D. N. Pal; Hony. Treasurer—Dr. A. K. Poddar; Members of the Executive Committee—Drs. D. K. Mitra, S. N. Chatteriee and B. B. Chakravarty.

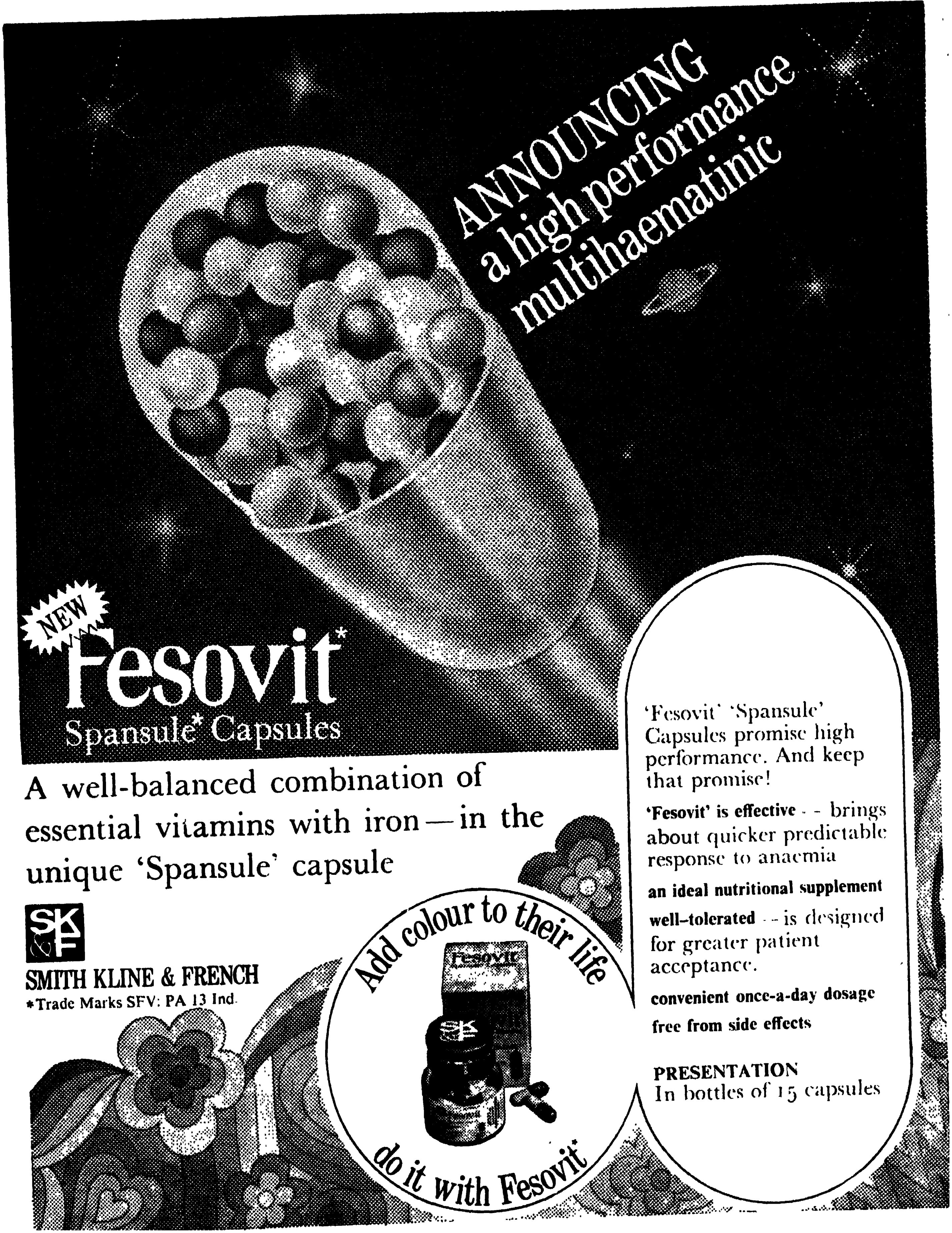
A symposium on Skin Diseases was arranged on 17-4-71 jointly with the doctors of South Eastern Railway, Kharagpur. The symposium was presided over by Prof. B. N. Banerjee, Head of the Department of Dermatology, University College of Medicine, Calcutta, and inaugurated by Shri S. Krishnan, Divisional Superintendent, S. E. Railway, Kharagpur. The speakers included Prof. S. Ghosh Head of the Department of Leprosy, School of Tropical Medicine, Calcutta; Prof. S. C. Mitra and Dr. R. K. Panja, Heads of Department of Dermatology respectively of Calcutta National Medical College and Calcutta Medical College; Dr. A. K. Dutta, Secretary and Hony. Lecturer in Dermatology, University College of Medicine, Calcutta; Dr. B. Haldar and Dr. (Major) S. Chatterjee of Calcutta and Dr. S. R. Tripathy, Dr. P. K. Chatterjee and Dr. D. N. Pal of S. E. Railway. A large number of doctors from Kalaikunda, I.I.T., Midnapore and Calcutta, besides those from Kharagpur, participated in the symposium. Earlier a "Medical Fun" marking the occasion was conducted by Dr. Y. P. Kohli, Divisional Medical Officer, S.E. Railway, Kharagpur. Later, prizes were awarded to the doctors for making the best diagonosis based on examination of photographs, x-ray plates and patients of skin diseases. The Secretary of the branch, Dr. D. N. Pal thanked Dr. S. K. Malhotra, Chief Medical Officer, S.E. Railway and Dr. V. M. Ghosh, Medical Superintendent of S.E. Railway Hospitals, Kharagpur, for their co-operation.

Howrah Branch– The annual general meeting was held on 4-11-71 at Howrah Medical Club premises. Dr. Debiprasad Mukherjee presided. Dr. Dinabandhu Banerjee, Hony. Secretary, placed the annual report for 1970-71.

According to his report the branch had 271 members on the roll during the year. Efforts were made during the year to secure a piece of land at Church Road, Howrah, for the building of the branch. The branch observed the Health week which was organised on district level jointly with 10 local branches at the Uluberia H.S. School, Uluberia. An elaborate programme consisting of lectures on public health topics, educative film shows, public meeting and health exhibition with facilities for inoculation against cholera and small-pox as also for B.C.G. vaccination was gone through. The branch befittingly observed the E.S.I. Demand Day and the "All-India Doctors in Employment" Demands Day in compliance with the directives of the State Branch and the Action Committee of I.M.A. Six members of the branch were deputed for Family Planning training organised jointly by the State Branch and the Government of West Bengal. One member was sent to Delhi for similar training organised under the auspices of I.M.A. Headquarters. Besides contributing their mite for the relief of Bangladesh refugees during the national emergency, members of the branch rose to the occasion by volunteering their services for first-aid posts and co-operating with the civil defence programme. Dr. Gouri Sankar Mukerjee from this branch was re-elected President and Dr. Satyendu Kundu elected Joint Secretary of the Bengal State Branch for 1971-72 session. Dr. Dinabandhu Bannerjee, Hony. Secretary, was re-elected a member of the Executive Committee of the Medical and Veternery Section of Indian Science Congress for its Aligarh session, 1972. Four members of the branch participated in the 7th I.M.A.—sponsored Study Tour abroad.

The above report was adopted in the meeting. The following were elected office-bearers and members of the executive committee for 1971-72:

President—Dr. Biswanath Set; Vice-Presidents—Drs. purnendu Narayan Khan, Dulal Ch. Dutta and Sushil Kumar Chatterjee; Hony. Secretary — Dr. Dinabandhu Bannerjee; Joint Secretaries — Drs. Nakuleswar Halder, Chinmoy Gupta and Anil Kumar Kundu; Members — Drs. Sisir Kumar Sen, Bhaben Moitra, Binoyendra Nath Mukherjee, Dhrubaranjan Sarkar, (Mrs.) Susama Mal, Brahmananda Chatterjee, Joy Krishna Mondal, Dayamoy Manna, Bholanath Banerjee, Debabrata Paul, Probash Kumar Seth and Lakshmi Narayan Mullick; Representatives to State Council—Drs. Bibhuti Bhusan Das, Debi Prasad Mukherjee and Dulal Chand De; Representatives to Central Council—Drs. Pashupati Ghosal, Satyendu Kundu and Biral Chand Mullick; Alternate Representatives—Drs. Biswaratan Mukherjee, Ramanath Bhattacharjee and Dinabandhu Bannerjee.



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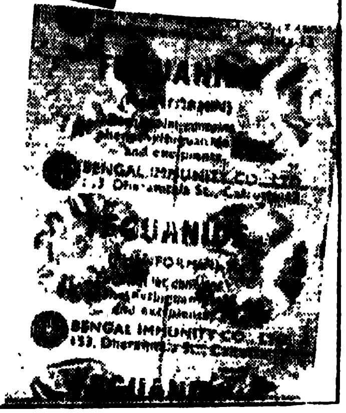

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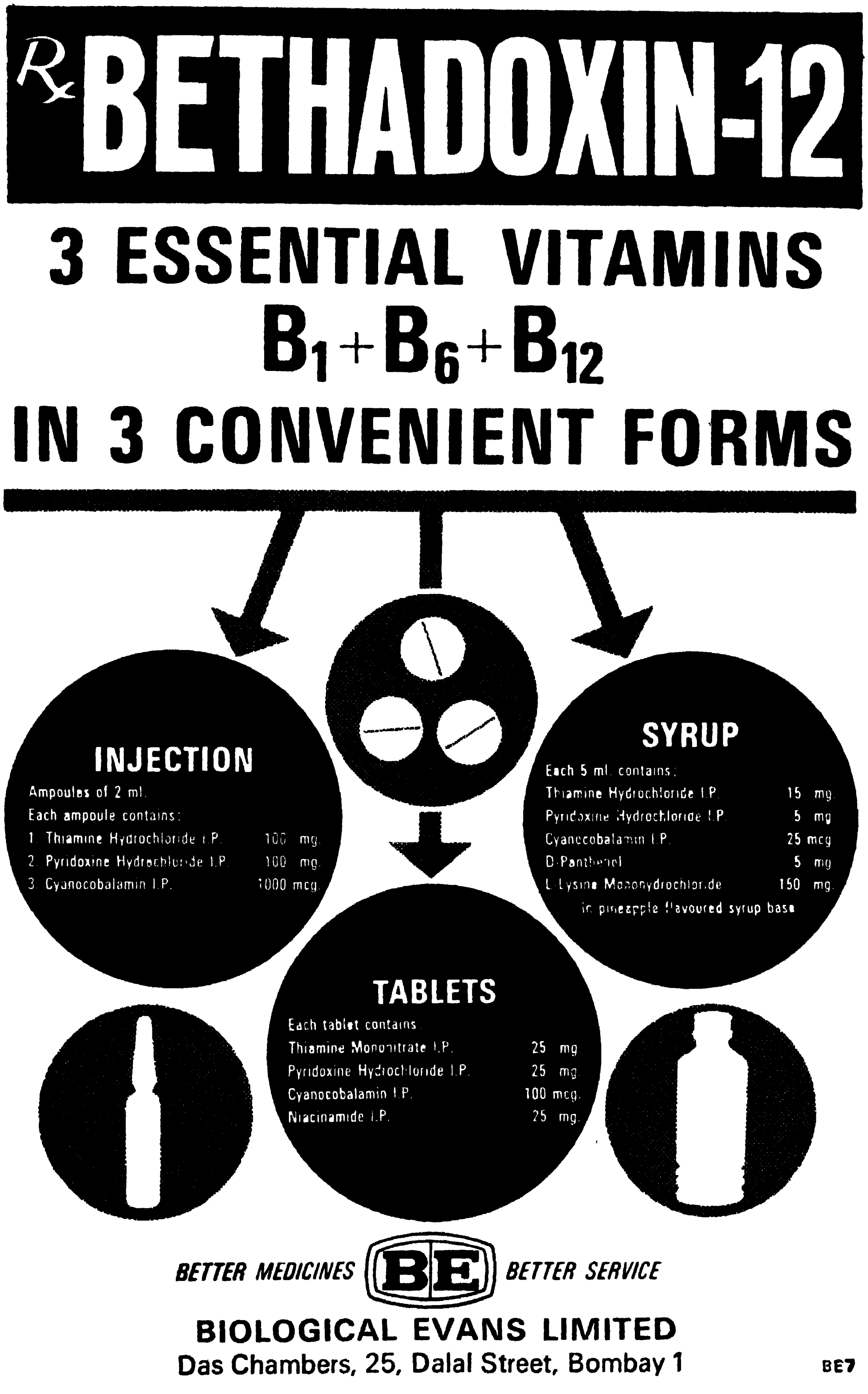

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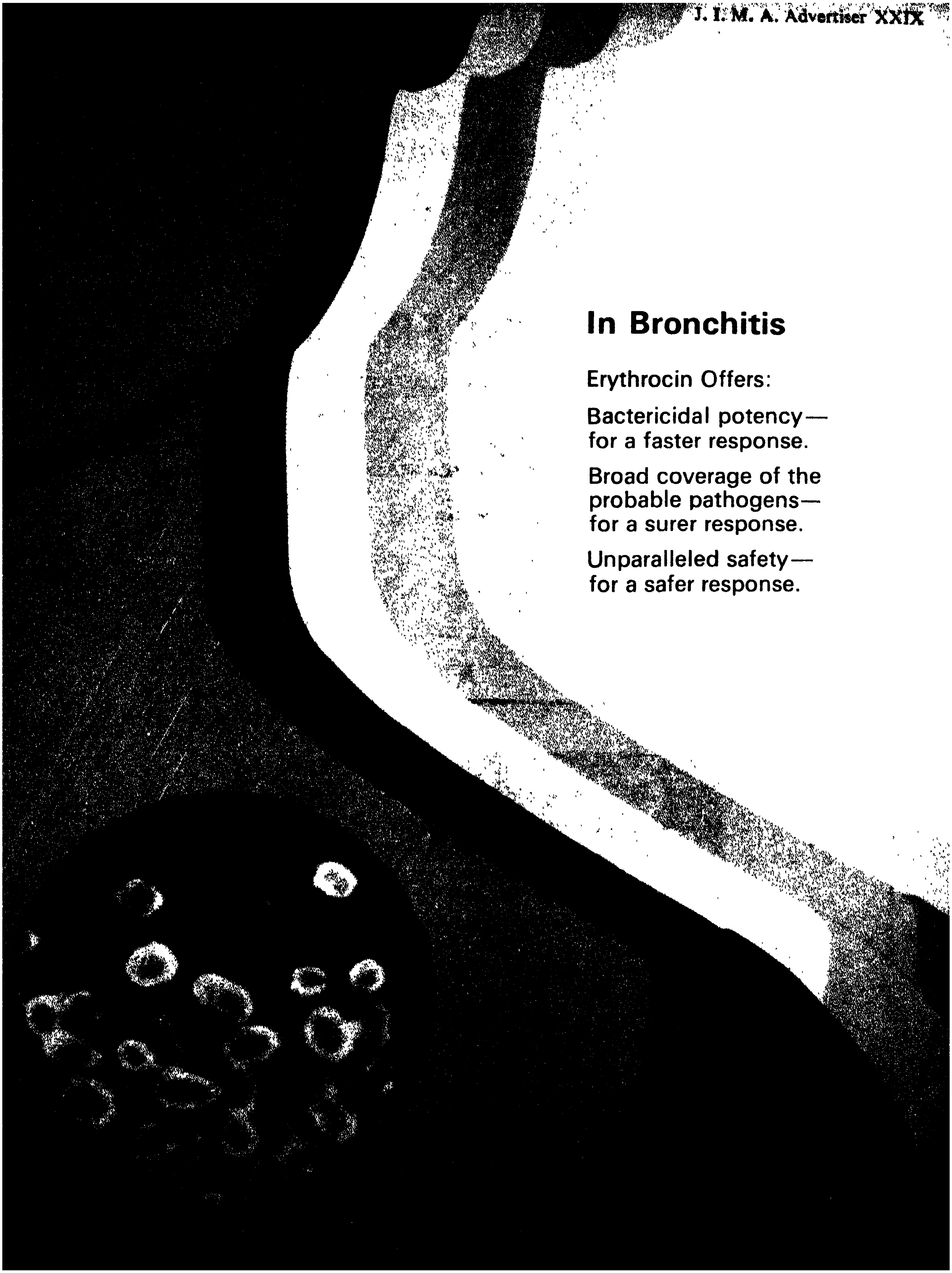

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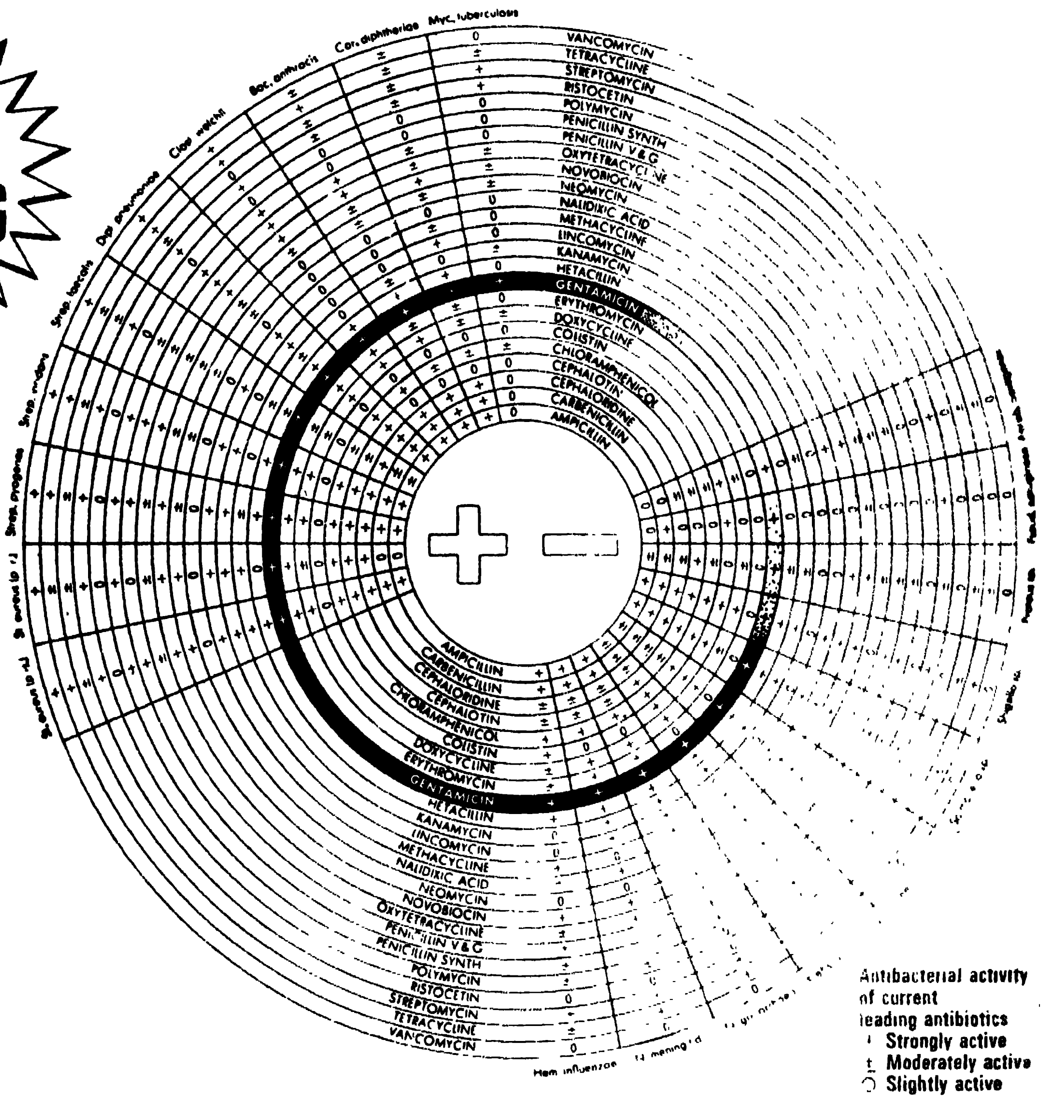

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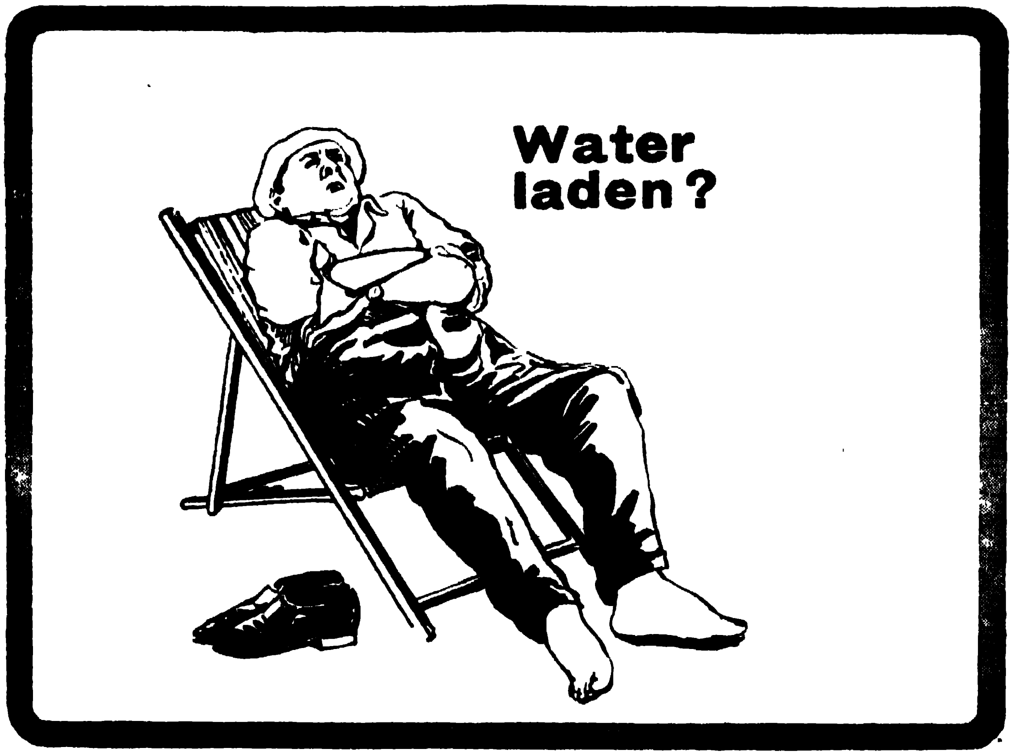

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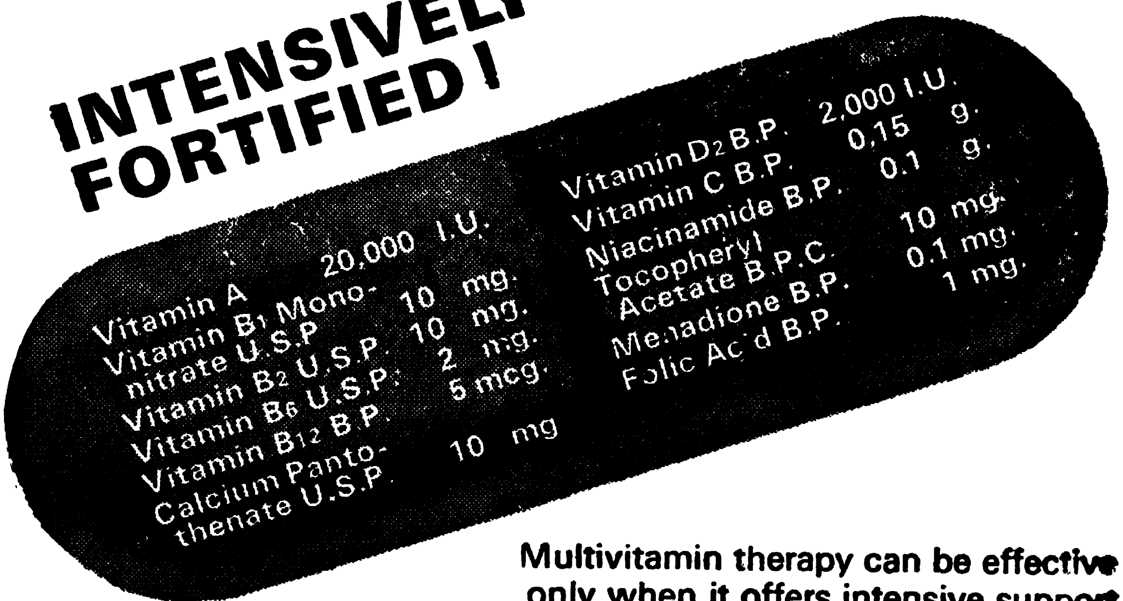

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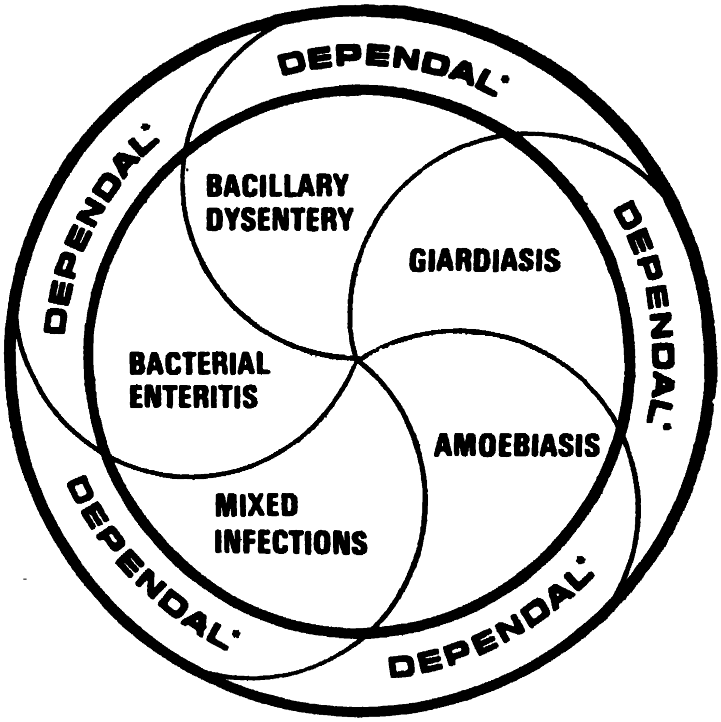

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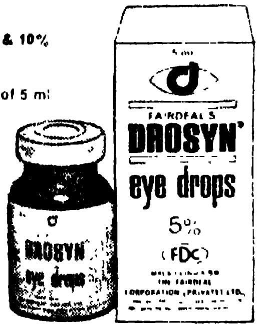

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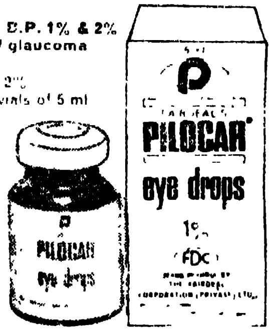

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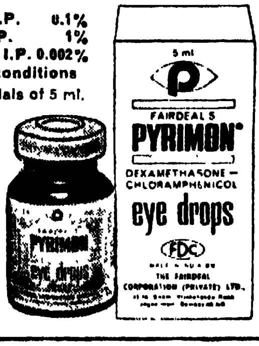

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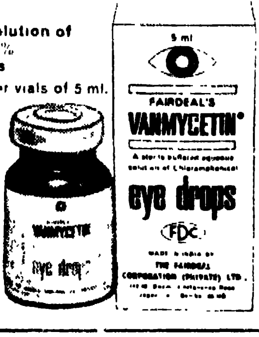

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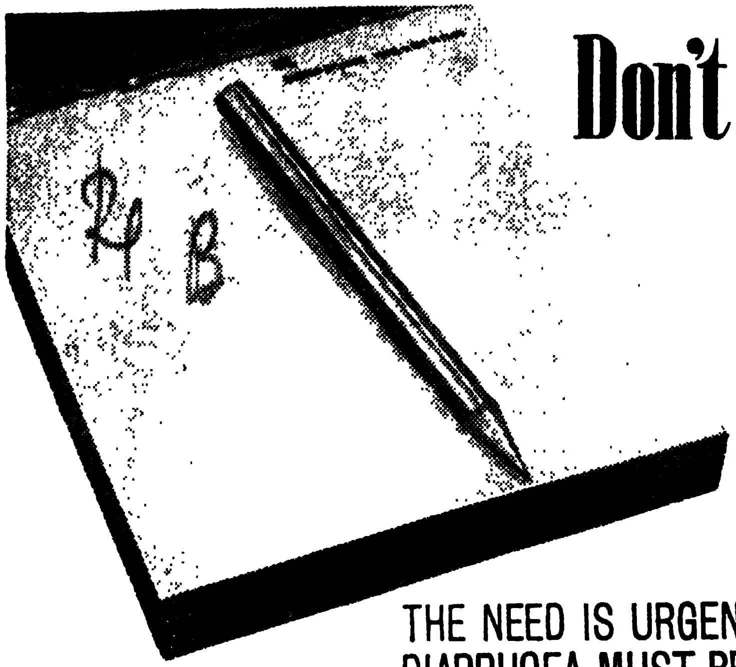

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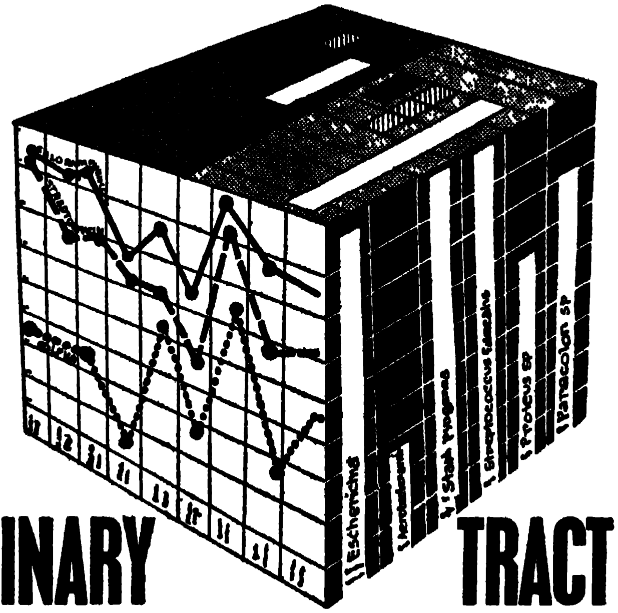

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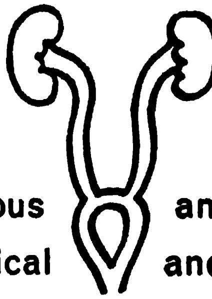

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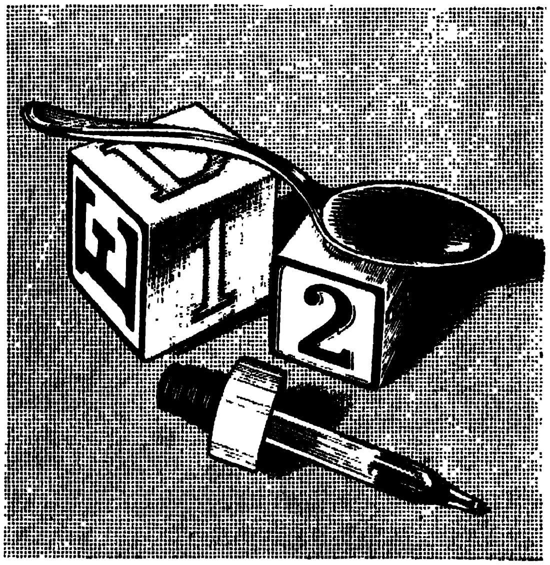

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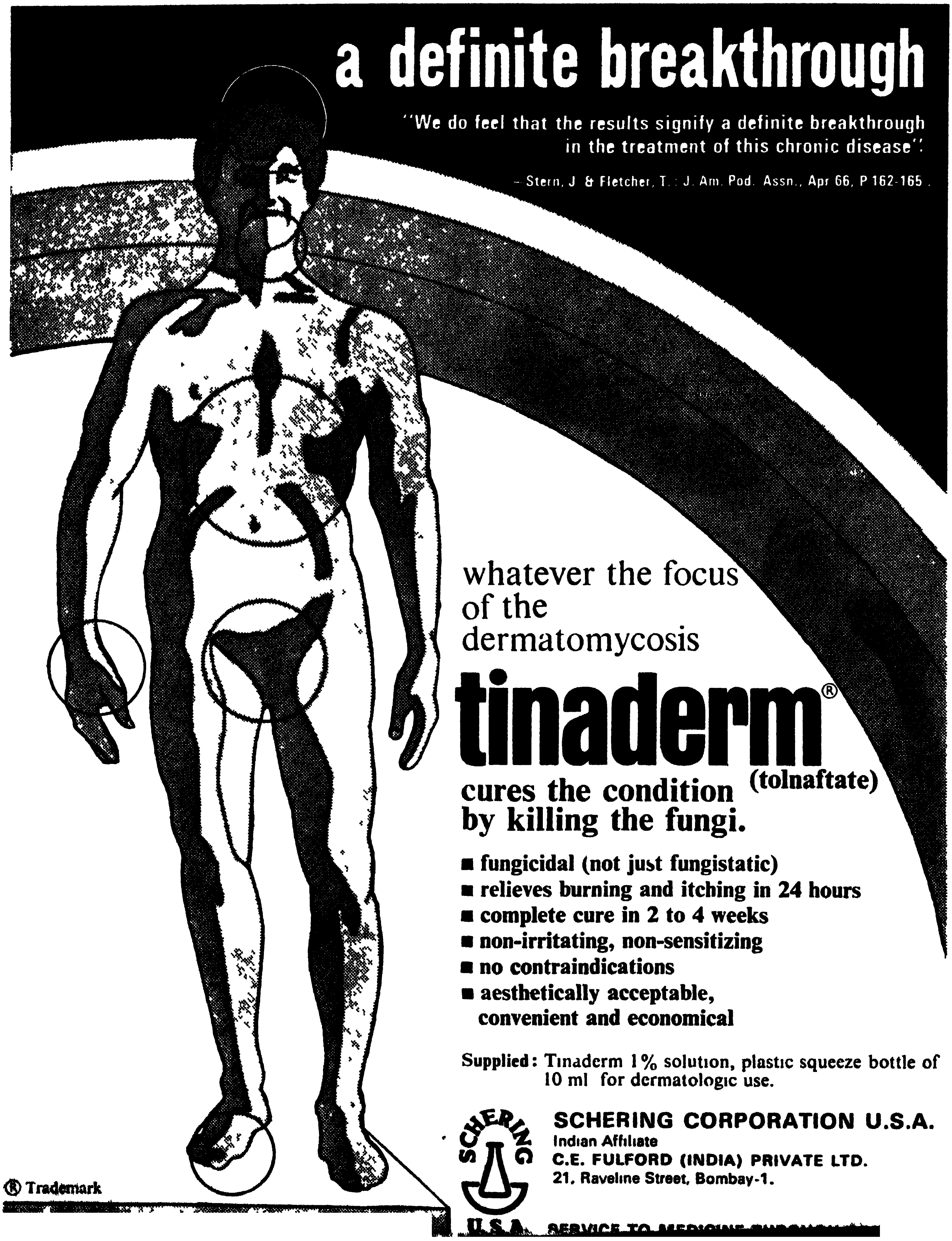

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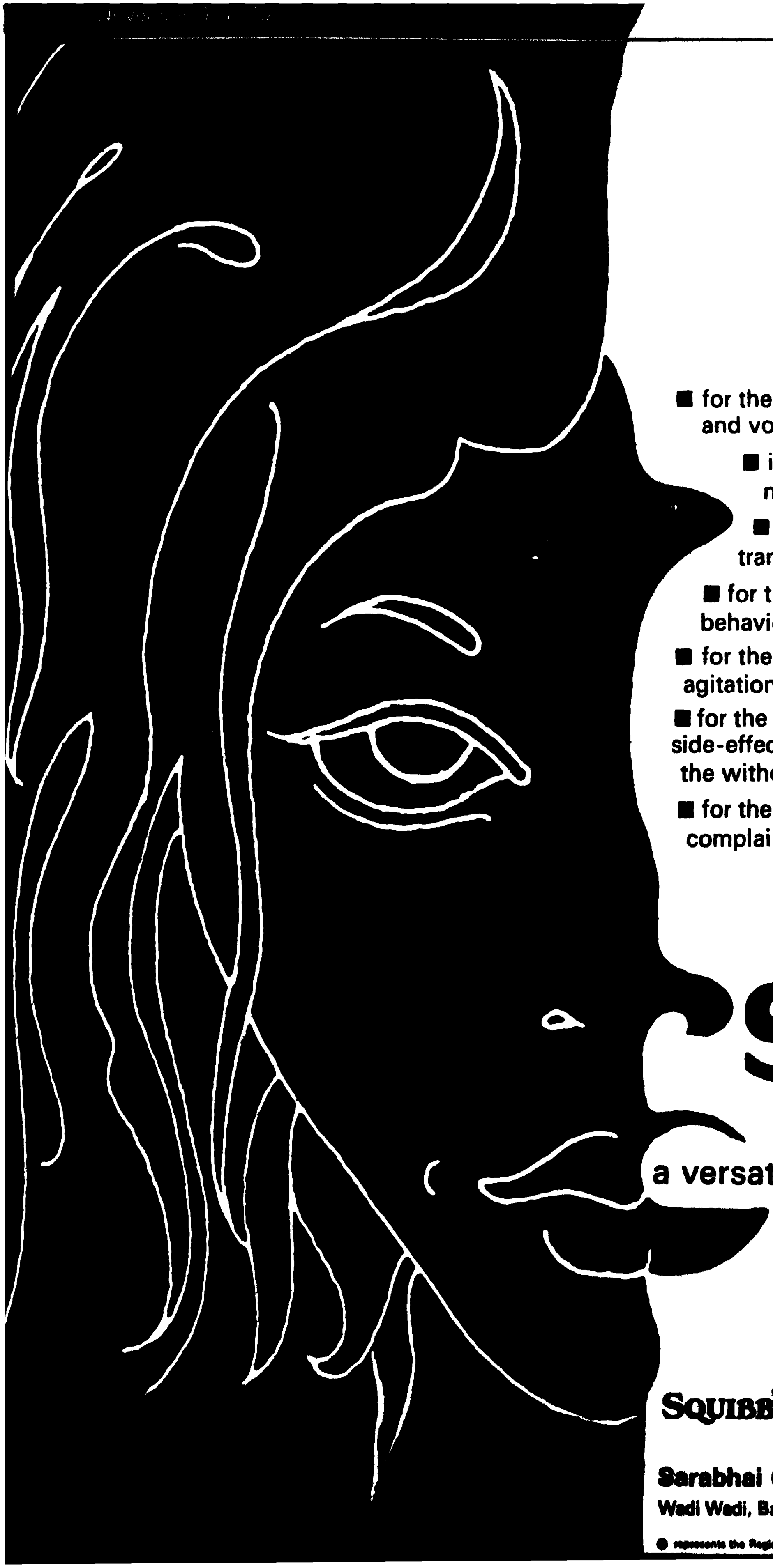

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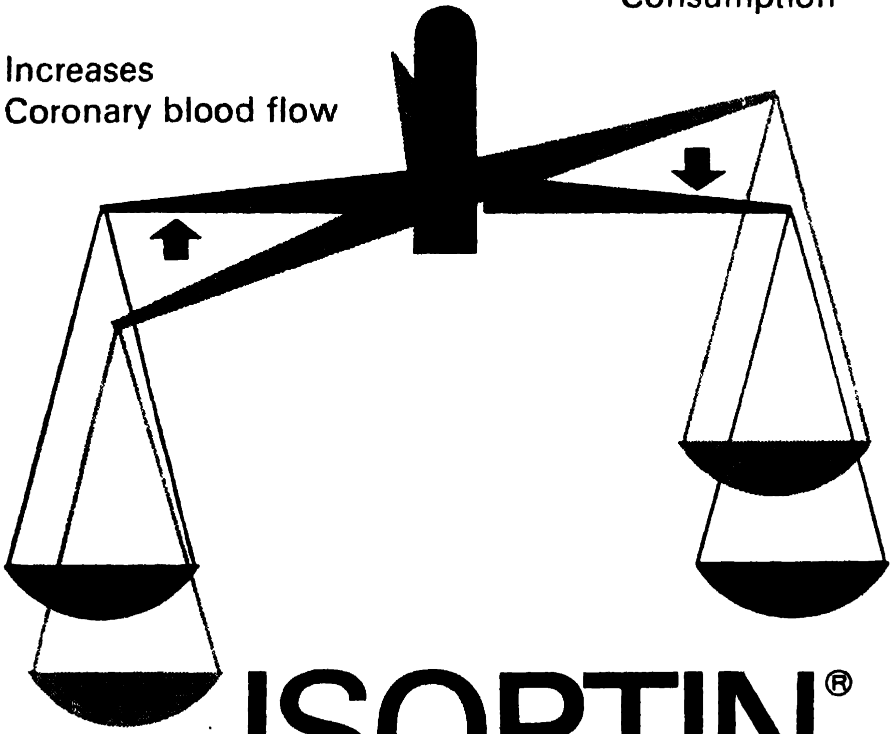

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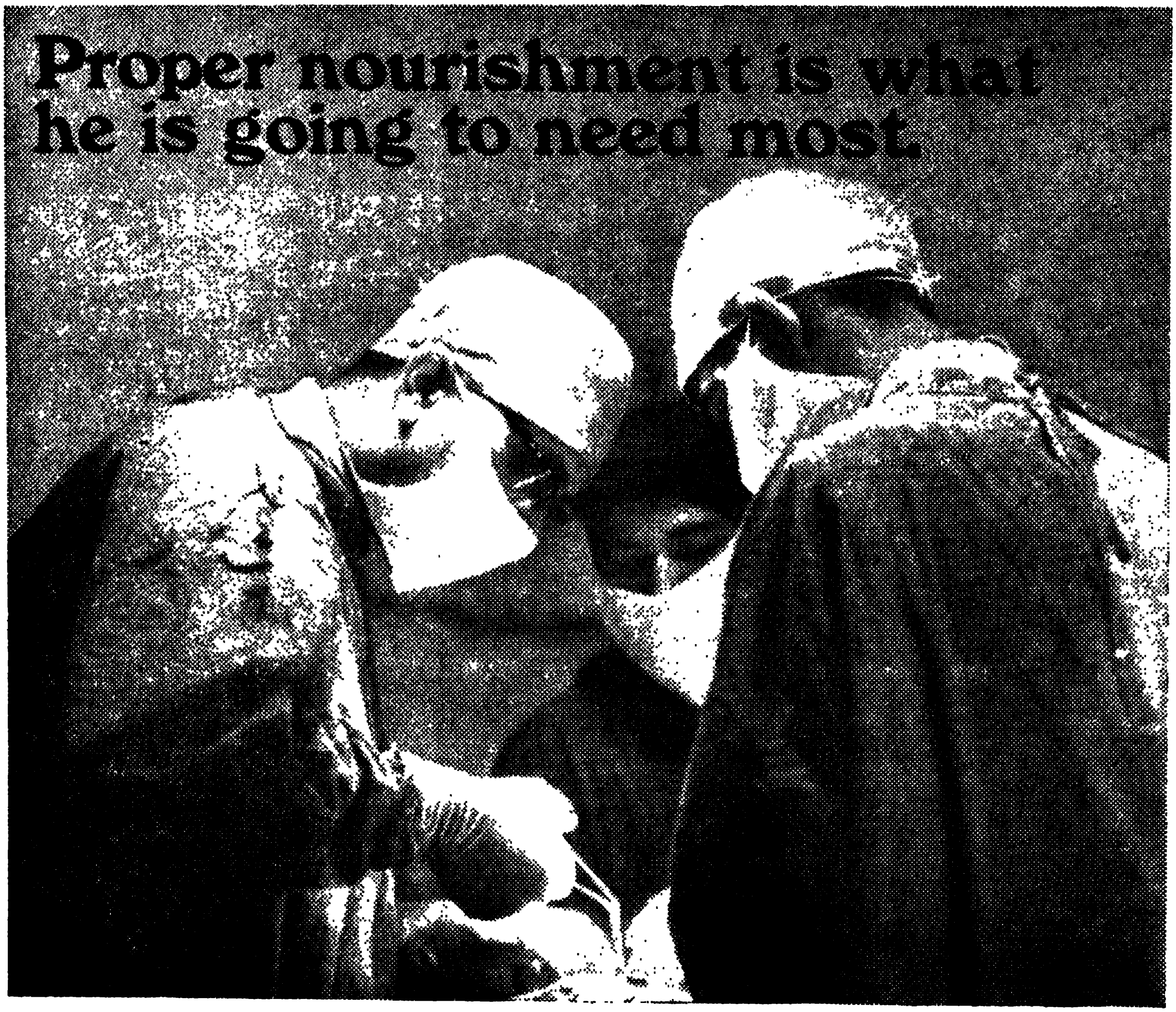
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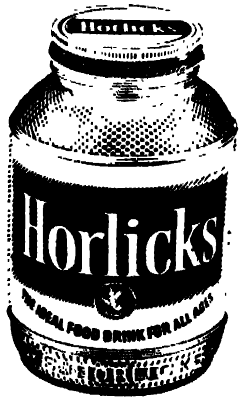

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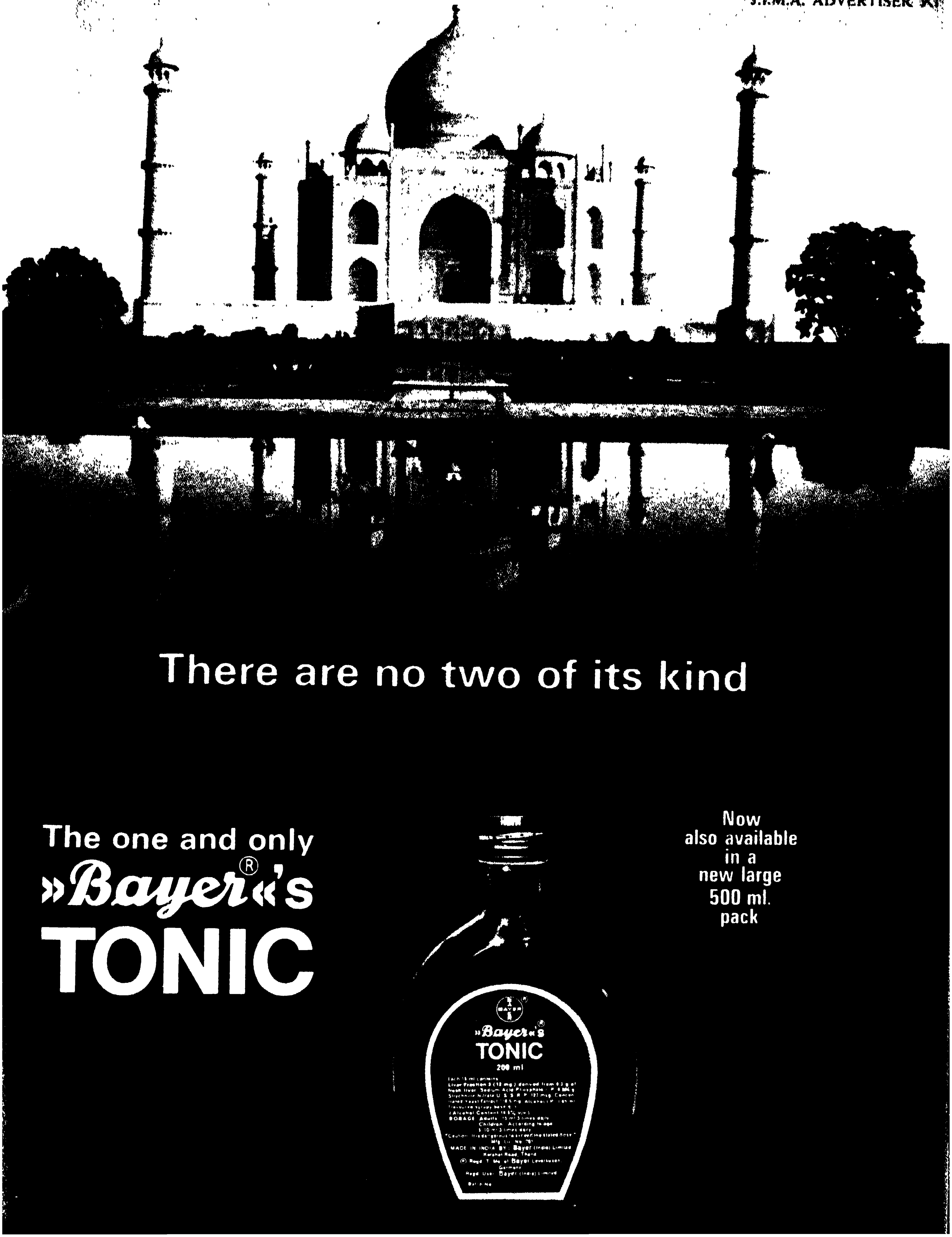
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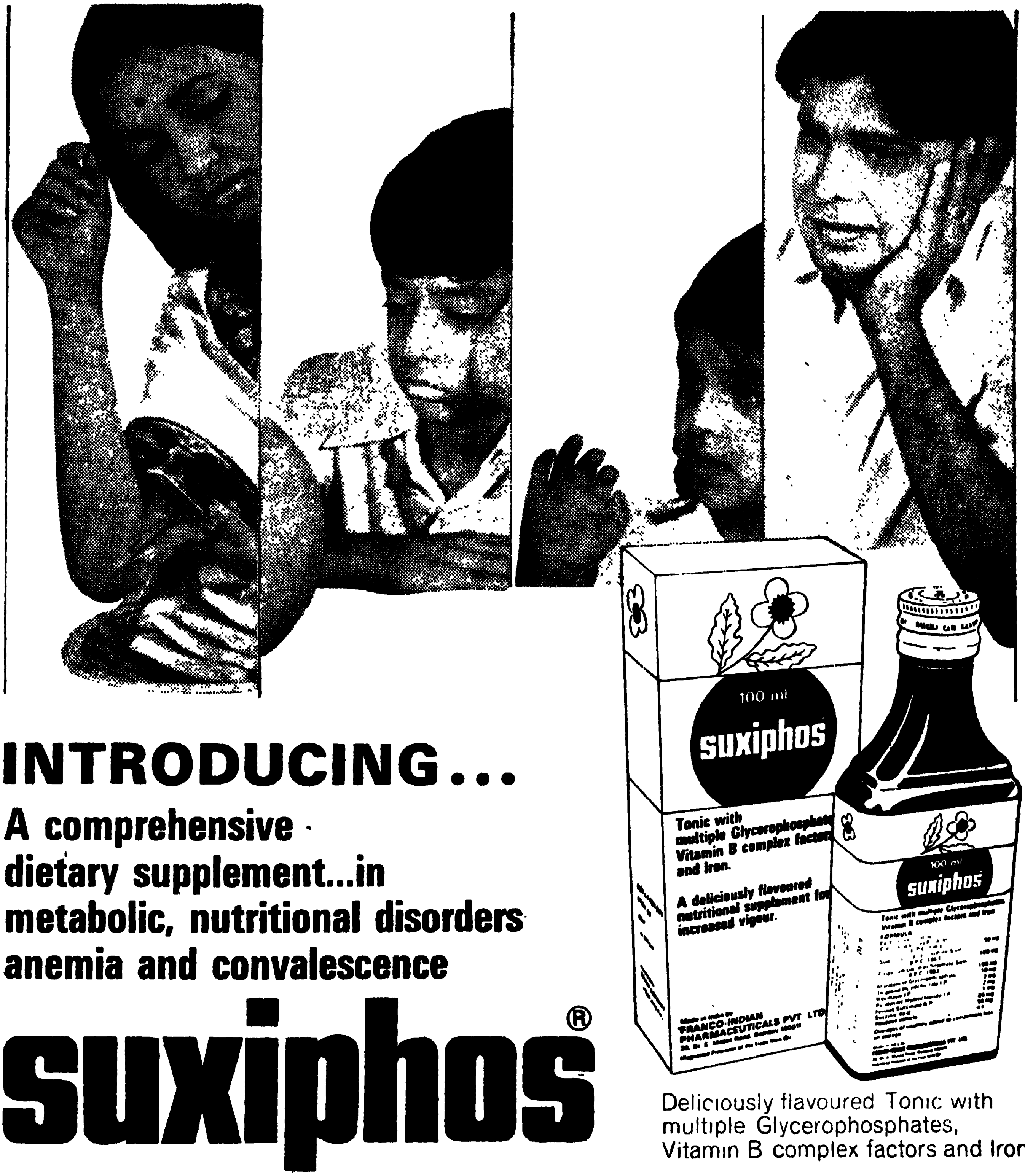
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Place : KARNATAK MEDICAL COLLEGE, HUBLI-580022

TO ALL MEMBERS OF IMA

The Chairman and members of the Reception Committee of 49th All India Medical Conference are very happy to invite you and your family to this conference to be held from 28th to 30th December, 1973. The Organising Committee is making every effort to accord you a warm welcome to Hubil and make your stay happy.

Hubil and Dharwar are twin cities of Hubli-Dharwar Corporation, situated midway between Bangalore and Poona on the national high way connected by rail, road, also by air via Belgaum air strip which is hardly 60 miles. Hubli is the second biggest city in Karnatak State, an educational, business and industrial centre. The venue of the conference will be at the Karnatak Medical College which is one of the premier institutions of the state, imparting both undergraduate and postgraduate medical education and has a superb campus.

Registration :

Registration booth will be opened in the campus from 27th December, 6-00 p.m. Every delegate or visitor is requested to register his or her name as follows :

Delegate fee	Rs. 5/-
Visitor (IMA Member) ...	Rs. 5/-
Visitor (Non Member) ...	Rs. 10/-
Incidental & Food Charges (for period of conference)	Rs. 45/-
For Social Member ... (food & incidental charges)	Rs. 35/-
Child above 5 Years ...	Rs. 20/-
Banquet on 29th December	Rs. 15/-
Reception Committee Member (Reception Committee members are entitled to all facilities of the Conference except accommodation)	Rs. 100/- (Minm.)

The incidental and food charges are compulsory for all except Reception Committee members. Daily food tickets are not available.

Please send the cheque or draft drawn in favour of 49th All-India Medical Conference and include Rs. 1-50 as Bank charges. To avoid last minute rush in the Registration counter, we request you to register in advance by sending Form 'A'. Those who have sent delegate fees to the headquarters office of IMA at New Delhi, are requested to produce receipts for the same at the counter to avoid confusion.

Scientific Session :

A fruitful Scientific Session is also being arranged during the Conference. Our Scientific Sub-Committee is arranging panel discussions, guest lectures by eminent speakers apart from short paper presentations by the members of IMA during the conference.

Accommodation :

Accommodation will be made available in the various Hotels, at moderate rates on prior intimation and priority basis, *on advance payment*. The Hostel facilities are very much limited in the campus. The members are requested to intimate their requirements of their lodging in Form 'B' indicating choice of rooms by marking [√] over the tarriff of their choice.

Food & Catering :

The Conference catering will commence on 28th December, 1973 with serving of breakfast in the venue of the Conference and will end with Tea at 4-00 p.m. on 30th December, 1973. On the night of 29th, ordinary dinner will not be served. The banquet will be arranged on the same night. Participation is by payment of Rs. 15/- per head. You are requested to register your names for banquet. Guests are allowed on prior information on payment.

Climate :

Weather during December is pleasantly cool and light wollen garments during evenings are desirable.

Travel Bookings :

Hubli is a Railway Junction on South Central Railway (Bombay-Miraj-Bangalore, Hubli-Mysore, Hubli-Guntakal, Hyderabad-Hubli-Sholapur, Hubli-Goa). Advance-booking is very essential. You are requested to send your travel requirements for your return journey will in advance so that we spare no efforts to make your return journey comfortable. (The Railway concession forms may be had from Secretary IMA Headquarters, Indraprastha Marg, New Delhi). Kindly send Form 'C' duly filled.

A branch office of Indian Airlines is situated at Hubli. Those who are coming by air may kindly confirm return journey directly.

P.T.O.

Arrival :

Kindly intimate to us the date and time of your arrival so that our volunteers will be ready to receive you.

In view of the Guest Control Order, it is essential for us to know the exact number of delegates attending the Conference, so that proper permission may be taken for the meals to be served. You must therefore register *before 30th November*, otherwise we may be put in difficulties.

Railway Time Table

Train No.	From		To	Arrival	Departure
203	Bangalore	[E.]	Miraj	00-05	00-30
221	Guntur	[P.]	Hubli	04-05	—
235	Hubli	[P.]	Miraj	—	04-40
204	Miraj	[E.]	Bangalore	04-30	04-50
240	Hubil	[P.]	Sholapur P.	—	06-55
241	Sholapur	[G.E.]	Hubli Ex.	06-05	—
207	Bangalore	[K.E.]	Miraj	06-35	06-55
219	Bangalore	[P.]	Miraj	09-40	10-05
232	Hubli	[P.]	Sholapur P.	—	11-25
201	Bangalore	[Mail]	Miraj	12-55	14-10
229	Guntakal	[P.]	Hubli	13-20	—
230	Hubli	[P.]	Guntakal	—	15-35
202	Miraj	[Mail]	Bangalore	15-00	15-50
231	Sholapur	[P.]	Hubli	15-25	—
220	Miraj	[P.]	Bangalore	18-10	18-35
239	Sholapur	[P.]	Hubli	20-35	—
208	Miraj	[K.E.]	Bangalore	20-55	21-10
242	Hubli	[Gol. E.]	Sholapur	—	21-30
222	Hubli	[P.]	Guntur	—	23-15
236	Miraj	[P.]	Hubli	22-55	—

Air Lines

IC 155
11 - 30 hr. Dep. Bombay
12 - 50 hr. Arr Belgaum
(IC 156)
13 - 20 hr. Dep. Belgaum
14 - 40 hr. Arr. Bombay

FORM "A"
REGISTRATION FORM

This form is to be filled in by all members of the medical profession attending the Conference and posted in time so as to reach the Organising Secretary at the above address before *30th November, 1973.*

Name (in Block letters).
Full Address:
Member of the Local Branch and State Branch
Member of Working Comm./Central Council/
Ordinary Member
Date and time of arrival at Hubli.
Travelling by: Train/Bus/Air/Car.
No. of days you desire to stay in Hubli

Accommodation required : a. Own arrangements
: b. Hotels
: c. Staying in Delegates campus

Whether attending along with family ?
State No. attending: Adult: Children:

Food & Catering: State whether Vegetarian or non-Vegetarian.

Kindly fill in this form and send it along with the remittance to DR. ANANTHARAJU, Organising Secretary, 49th All India Medical Conference, KARNATAK MEDICAL COLLEGE, HUBLI-580022, Advance Money should be sent by D. D. or Cheque payable to 49th All India Medical Conference, Hubli, 1973.

I am sending herewith Rs. (Rupees) in all by a D.D./Cheque No. dated towards the advance payment of the following: Rs.

Total

FORM "B"
ACCOMMODATION RESERVATION

Address in Capital Letters
I will stay in the Hotel
For days from............to............
I will stay in Hostel (if available).
No. of persons (Please specify):
1.
2.
3.
I hav eenclosed a cheque for Rs.
(Rupees
(towards accommodation)

TARIFF OF HOTELS	Range
Single Room	Rs. 3—4
Double Room	Rs. 6—10
Single Room with bath attached	Rs. 6—12
Double Room with bath attached	Rs. 12—25

(The higher the cost, more facilities)

Please tick the preference of the type of accomodation needed. Accommodation Committee will make arrangements with suitable modifications as it feels necessary from time to time. Hotels Room charges will commence from the date of reservation. —

Out-station cheques should accompany Rs. 1-50 extra being collection charges.

FORM "C"
REQUEST FOR RETURN AIR/RAIL BOOKING

Please arrange return reservation to........................
...............by.....................on......... ....
for persons.
My ticket No. is Class

[State whether Air or Rail and give flight/Train number, Name, Address and Age of persons travelling [*in block letters*]

Signature

This form should be sent to Organising Secretary, 49th All India Medical Conference, Karnatak Medical College, Hubli-580022, well in time along with the ticket and service charges of Rs. 6/- duly accompanied by a Demand Draft in favour of "49th All India Medical Conference Hubli"

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ORIGINALS AND PAPERS

1

Clinico-Epidemiological Study of Leprosy in Calcutta †

(Follow-up Work at the Homes of the Patients, and Suggestions for Control Measures)

S. C. SEAL*, AMAL GHOSE-HAZRA**

[Received for publication August 30, 1972]

Having obtained a preliminary idea of the attendance of leprosy patients along with other informations like age, sex, religion, occupation, residence, marital status, literacy, housing, food habits and economic status, etc., from the dispensary registers of the three clinics in Calcutta, as reported in a previous communication (Seal *et al.*, 1971), it was found necessary to follow the patients in their homes to make a more detailed study of the clinical types, duration of illness, and other epidemiological conditions through personal interview with the patients in their home surroundings. The findings are reported in this communication with some suggestions for control measures.

MATERIAL AND METHOD

The task of meeting leprosy patients in their home surroundings was somewhat difficult as the majority of them did not like any investigator to visit them at their homes for which they offered the following reasons: (i) The possibility of ostracisation by the family members, (ii) social barriers imposed upon families giving shelters to their relatives affected with leprosy, (iii) loss of employment if the co-workers come to know about the disease, (iv) psychological factors, some of the patients actually recorded a false address in the clinic registers to avoid trouble. Most of the patients were, therefore, first met at the clinic and attempts were made to make them agree to the visit on assurance of full secrecy as a personal friend.

The home visits were accordingly made by appointment of time most suitable to the individual patient. In spite of this, all visits were not successful in the first attempt. In about 25 to 30 per cent of cases more than one repeat visit was necessary. A 5 per cent sample of 6602 patients namely, 330 cases, who attended the three clinics—(i) Premananda Charitable Leprosy Clinic, (ii) South Calcutta Skin Clinic and (iii) Leprosy Clinic of the School of Tropical Medicine, during the year 1961 or 1965-66, was drawn. Out of these, 9 patients never agreed to the visit under any circumstances and 22 others said that they had no residence. The information was therefore recorded for 330 patients in a proforma prepared for the purpose, besides analysing the data collected in the clinics from 270 patients. The results of analysis of these records are briefly presented here.

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† This paper is a continuation of the paper published earlier in the December 1, 1971 issue of this journal

All India Institute of Hygiene and Public Health, Calcutta 12

* Ex-Professor of Epidemiology

** Ex-Assistant Professor of Epidemiology

OBSERVATIONS

(1) *Clinical types of leprosy cases*—The number of new leprosy patients and their clinical types treated at the OPD of the School of Tropical Medicine, Calcutta together with the results of bacteriological examination during the period between 1961-62 and 1965-66 (5 years) are given in Table 1.

The data presented in Table 1 show that there was a steady flow of new cases in the OPD of the School of Tropical Medicine during 1961-62 to 1965-66 as was found in the Premananda Leprosy Clinics reported in an earlier communication (Seal *et al.,* 1971). Also, 4 to 6 per cent of the non-lepromatous cases were found bacteriologically positive.

The proportion of lepromatous to non-lepromatous patients was 23·7:72·4. The latter consisted of tuberculoid, maculo-anaesthetic, and polyneuritic types. The intermediate and indeterminate forms constituted only 3·9 per cent. Bacteriologically, 91·9 per cent of lepromatous and intermediate types and 4 to 6 per cent (average 4·9 per cent) of the non-lepromatous type were bacteriologically positive. Among the 330 patients, visted at their homes, the proportion of lepromatous to non-lepromatous cases was 30:70 against 27·6:72·4 noted in 270 cases selected from the clinic registers (Seal *et al., loc. cit.*).

(2) *Duration of illness*—(a) The duration of illness by age groups, as far as the patients or their relations could tell, is given in Table 2.

TABLE 1 SHOWING CLINICAL TYPES OF NEW LEPROSY PATIENTS ATTENDING THE LEPROSY CLINIC AT THE SCHOOL OF TROPICAL MEDICINE DURING 5 YEARS 1961-62 TO 1965-66

Year		Number of leprosy patients					
		Clinical Types				Confirmed bacteriologically	
		Lepromatous	Non-lepromatous	Intermediate	Total	Lepromatous*	Non-lepromatous
1961-62	...	938	2828	225	3991	1163	177 (6·2%)
1962-63	...	1045	3109	180	4334	1006	152 (4·88%)
1963-64	...	1105	2892	129	4126	1195	141 (4·87%)
1964-65	...	938	2898	130	3966	908	130 (4·5%)
1965-66	.	821	3101	128	4050	908	127 (4·1%)
Total		4847	14828	792	20467	5180	727
Annual average	.	969	2966	158	4093	1036	145
Annual per cent	...	23·7	72·4	3·9		91·9	4·9

* Including intermediate type

TABLE 2 — SHOWING THE DISTRIBUTION OF LEPROSY PATIENTS BY AGE GROUPS AND DURATION OF ILLNESS CALCULATED FROM THE DATE OF FIRST DETECTION OF SYMPTOMS

Age groups (years)			1 year	2 years	3 years	4 years	5 years	10 years	15 years	Total	
										No.	%
3—5	...	...	3		3					6	2·2
6—10	..	...	3	12	3					18	6·7
11—15	...	...		7	3	2				12	4·4
16—20	...	...		16	8	11	3	2	2	42	14·4
21—25	...	...		13	11	12	3	6		45	20·0
26—30	...	...		6	8	6	4	3	6	33	10·0
31—40	...	...		33	9	8	3	16	3	72	26·0
41—50	...	...		15	12		2		7	36	13·3
50 and above		...		3				3		6	2·2
Total	...	...	6	105	57	39	15	30	18	270	
Per cent	...	...	2·2	38·9	21·1	14·4	5·5	11·1	6·6		

TABLE 3—SHOWING DISTRIBUTION OF LEPROSY PATIENTS BY AGE AT WHICH THE SYMPTOMS WERE FIRST DETECTED

Age period at first symptom (years)	Types of leprosy							
	Lepromatous		Non-lepromatous		Intermediate		Total	
	No.	%	No.	%	No.	%	No.	%
2—5		0·0	8	3·0	0	0·0	8	3·0
6—10	4	1·5	18	6·7	8	3·0	30	11·1
11—15	2	0·75	10	3·7	3	1·1	15	5·5
16—20	7	2·6	46	17·1	12	4·4	65	24·0
21—25	12	4·4	12	4·4	8	3·0	32	11·8
26—30	6	2·2	9	3·3	3	1·1	18	6·6
31—40	9	3·3	39	14·4	21	7·8	69	25·5
41—50	—	—	24	8·9	6	2·2	30	11·1
50 and above ...	—	—	3	1·1	—	0·0	3	3·0
Total	40	14·8	169	62·6	61	22·6	270	

The data in Table 2 show that 162 patients or 60 per cent had detected signs and symptoms 2 to 3 years before attendance. These patients included all age groups between 5 and 50 years, the largest number being 42, belonging to the age group 31-40 years, 27 to 41-50 years and 3 to above 50 years. It indicated fairly frequent adult susceptibility, unless it is postulated that they had all been infected in childhood. Besides, the percentage of patients in 0-15 years is only 13·3 per cent against a proportion of about 30 per cent in the population. There were, however, 39 patients (14·4 per cent) with duration between 3-4 years, 15 patients (5·5 per cent) with duration between 4-5 years, 30 patients (11·1 per cent) between 5-10 years and 18 patients (6·6 per cent) between 10-15 years.

(b) *Age*—The ages at which the symptoms were first noted in 270 patients calculated by subtracting the duration of illness from the current age of each patient and are shown in Table 3.

It will be seen from Table 3 that non-lepromatous type started at an earlier age than the lepromatous and it appears that the persons of age group 16-20 years and 31-40 years were relatively more affected by infection than the earlier age periods. The youngest affected was 2 years old. In lepromatous patients both lower and higher age groups were not affected whereas the non-lepromatous type was detected first time at all age groups and the intermediate types behaved similar to the lepromatous type. On the whole, it appears that adults are no less susceptible than the children. Three persons in this group appear to have been affected even after the age of 50 years. This field observation has to be given some credence unless it is postulated that infection taking place in early life disappeared by self-healing (Lara and Nolasco, 1956) and then reappeared by relapse or reinfection as in tuberculosis, or that infection lies dormant and becomes manifest in some cases by a process of breakdown of tissues resistance. But the number of cases is too large in the adult group to be explained by any of the above hypothesis alone.

(c) *Duration of illness and length of stay at Calcutta*—The duration of illness has been shown against the length of stay in Calcutta in Table 4.

Out of 270 patients 45 (16·5 per cent) were coming from outside for treatment. Of the remaining 225 (83·3 per cent) patients, 219 indicated their place of stay in Calcutta for periods varying between less than 6 months to more than 30 years. There are 48 patients marked with asterisks in Table 4 who had acquired infection before they came to the city, 16 were border-line cases whose length of stay in Calcutta had been given the same as that of the duration of illness. But there were 155 cases (57·4 per cent) who apparently imbibed the disease while residing in the city. Sixty-five cases, whose period of stay varied between 3 and 30 years or more, showed symptoms within 2 years before attending the clinic. There were 39 others whose duration of stay varied between 10 and 30 years and who detected their disease between two and three years prior to their clinic attendance and so on. Thus, the city of Calcutta itself is a potent endemic centre of leprosy.

(d) *Duration of illness in the three groups compared*—The duration of illness of the three groups of patients studied are shown in Table 5.

TABLE 4—SHOWING THE DURATION OF LEPROTIC ILLNESS SHOWN AGAINST THE LENGTH OF STAY IN CALCUTTA

Length of stay in Calcutta	Duration of illness							
	1 year	2 years	3 years	4 years	5 years	10 years	15 years	Total
6 months	2*	6*	7*	8*	4*	2*		29
1 year		8*						8
2 years		3	2*					5
3 years						3*		3
4 years		3				3*		6
5 years	4	4		4	3			15
10 years		15	5	7	2	7	3*	39
15 years		24	22	11	1	4	3	65
20 years		5	3		2	2	4	16
25 years		4	5	3			5	17
30 years			4					4
30 years above ...		6			3		3	12
Not known			3			3		6
24 Parganas		27	6	6		6		45
Total	6	105	57	39	15	30	18	270

* These patients were suffering before they came to Calcutta for treatment

TABLE 5 — SHOWING THE DURATION OF ILLNESS OF THE PATIENTS EXAMINED IN 1954, 1968 AND 1966-67 AT CALCUTTA

Year	Duration of illness					
	—1 year	—2 years	—3 years	—5 years	—10 years	10 years and above
1954 ...	8·2	27·5	23·2	20·9	13·6	6·4
1966 ...	2·2	38·9	21·1	19·9	11·1	6·7
1966-67 ...	12·5	29·0	25·0	19·0	8·5	6·0

From Table 5 it is seen that the essential characteristics of the duration of illness according to the patients' own story of detection of symptoms has not changed between 1954 and 1966 except that the proportion of early cases (less than 2 years) attending the clinic improved slightly from about 35 to 41 per cent, the durations of illness being less than 2 years in 41·5 per cent, between 2 and 5 years in 44 per cent, between 5 and 10 years in 8·5 per cent and more than 10 years in 6·7 per cent of patients contacted at their homes. Deformity had just started in 8 cases (2·4 per cent) and was advanced in 2 cases.

(4) *Other epidemiological findings*—(a) The history of contact in the two groups of patients studied is given in Table 6.

TABLE 6—SHOWING HISTORY OF CONTACT OF LEPROSY PATIENTS IN CALCUTTA (1966)

Types of contact	In the sample from dispensary register 270		In the sample contacted at home 330		Combined result 600	
	No.	%	No.	%	No.	%
Family contact ..	27	10·0	23	7·0	50	8·3
Other contacts ...	—	—	—	—	—	—
No contact ...	—	—	13	4·0	13	2·2
Contact unknown ...	243	90·0	294	89·0	537	89·5

A definite history of contact was present only in 8·3 per cent of patients and as high as 91·7 per cent had neither any family history nor any contact with outside cases. It was definitely denied in 13 or 2·2 per cent cases and declared unknown by 89·5 per cent. During the home visit in 276 houses (excluding 9 who did not allow home visits and 22 who had no home) the existence of any clinical

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case in the houses of those patients who denied family contact could be discovered. In other words, only in the case of 50 patients multiple cases in a family was present, and the rest 550 cases (confirmed in case of 276 patients) were single cases only. The minimum period of known contact was less than 6 months. In these cases relations were the common sources, servants and co-workers coming next in order viz., father—22 cases (including 2 in the same father), brother—14 cases (including 2 in same family), sister—5 cases, servants—3 cases and co-wörkers—3 cases. Thus, a great majority of patients imbibed their infection from outside their families without any knowledge of contacts. Though in a city opportunities of unknown contact are many, these findings seem to be of great epidemiological importance and need very close studies.

(b) *State of isolation*—Isolation was satisfactory in only 20 per cent, unsatisfactory in 45 per cent and 35 per cent was not isolated at all. Even among 99 lepromatous patients as high as 38 or 38·3 per cent were not isolated, providing ample scope for the spread of the disease. Fortunately, open secondary cases were few and far between. Utensils were separate in 62 per cent, clothes and towels in 70 per cent and beddings in 60 per cent of the houses. No disinfectant was being used by any patient or household. Out of 330 patients 123 (37·3 per cent) were not living in their own families though only 5 of them had no relation and 6 left their families to remain isolated.

(c) *Treatment before attending the clinic*—Before attending the clinic as high as 63 per cent were having no treatment, 26·0 per cent had been under the treatment of some qualified doctors, 4·5 per cent under ayurveds and 6·5 per cent under quacks, homoeopaths and folklore, etc.

(d) *Mental equipment*—More than 56 per cent of the patients possessed a balanced or sober temperament, 35 per cent were indifferent, 7 per cent were actually depressed and about 2 per cent were complaining. The position in 1954 was amost similar. A more detailed study would be necessary to properly assess the psychological breakdown in leprosy patients.

DISCUSSION

Certain basic points which had been kept in view for elucidation in this clinico-epidemiological study of patients in Calcutta as enumerated in the preceding communication (Seal *et al.*, 1971) were: (1) Possible sources of infection ; (2) age susceptibility and sex differences ; (3) individual differences in susceptibility ; (4) prevalence of leprosy among different social and economic groups in urban areas; (5) possibility of leprosy being infectious long before it is conspicuous ; (6) position of social ostracism in urban communities. It may now be worthwhile to see how far the basic points can be answered from the observations made in connection with the above clinico-epidemiological study in Calcutta.

1. *Possible sources of infection*—For a long time the current idea was that leprosy spreads more or less by close contact with the open cases. In the present study evidence of close contact could not be obtained in about 90 per cent of cases as they could not give history of any known contact. Similar view was expressed by Dharmendra (1960), Badger (1964) and Cochrane and Davy (1964).

It is also a common belief that open cases (lepromatous) excrete organism more freely than closed cases (mostly tuberculoid and maculoanaesthetic types). It is true that non-lepromatous cases excrete little or very few organisms and as such are not so effective as a source of infection but it depends upon the susceptibility of the individual and the nature of contact he has with such cases to imbibe the infection. That in some areas the source of infection may be non-lepromatous cases is supported by the bacteriological findings of the present study and by the opinions of Dharmendra (*loc. cit.*) and Cochrane and Davy (*loc. cit.*).

2. *Age susceptibility and sex differences*—In the experience of leprosy workers based on earlier studies, involving mostly the rural areas, children were considered more susceptible than adults. A group of workers under Belra (cited by Cotter, 1947) conducted a study in Calcutta among 25,000 children and 2,000 beggars (1932-37). The corresponding incidence rates found were 0·3 and 12·0 per cent. Lately, a case finding investigation was carried out by the Leprosy Department of the School of Tropical Medicine (Ghosh, 1967) in an industrial area in Calcutta. Out of 2,530 persons examined 7 cases (L-2, N-5) were detected (prevalence rate—0·27 per cent) but no case was below 8 years of age, one case was in the age group 8-13 years and one in 14-18 years, both non-lepromatous. In the present study adults were seen to be equally susceptible, if not more. Similar findings were reported by Wade and Ladowsky (1952), Brown (1959) and Badger (*loc. cit.*). Again, if lepromatous cases are considered more infectious, among the 53 leprosy cases in children (Table 3) only 6 or 11·3 per cent were lepromatous compared to 23·7 per cent in the whole group. Similar observations were also made by Wayson (1934) in Howaii and Doull *et al.* (1945) in the Philippines. Ghosh (*loc. cit.*) examined 1,671 contacts of 507 infectious leprosy patients, only 31 or 1·81 per cent of them, all adults, were found to be infected with leprosy indicating comparative insusceptibility of children com-

pared to adults in the city. It may be due to the passive transference of immunity from mothers in a community which is on the way to acquire racial immunity.

The difference between the incidence rates of leprosy in males and females has been more or less observed by all workers, the males preponderating over the females in the ratio of about 2:1 (in the present study, involving the clinics only, it is 4:1). The males also suffer more from lepromatous type than the females. The cause for this difference is not yet well understood.

3. *Individual differences in susceptibility*—Out of 330 patients contacted at home 23 (7·0 per cent) gave history of family contact, i.e., multiple cases (Table 6). The average number of members in these families was 5·3 (range 1-32) whereas in the remaining 93 per cent of patients families there were only single cases in spite of the average number of members per family being 4·2. In these families no case was detected even among the conjugal groups (65·2 per cent). Thus, only a small percentage of those exposed to the infection got the disease. The same opinion was expressed by other workers including Dharmendra (*loc. cit.*) and Cochrane and Davy (*loc. cit.*). Thus, the familial susceptibility is scanty and the disease is not hereditary. However, our knowledge of immunity in leprosy has still remained imperfect.

4. *Prevalence of leprosy among different social and economic groups in urban areas*—It was formerly believed that leprosy was a disease of the rural areas affecting principally the poor (Rogers and Muir, 1946). It is now seen that it equally affects the urban population and the upper strata of the society as much as the other groups involving different occupational and literary sectors as shown in the earlier paper (Seal *et al.*, 1971). These findings mean that the urban characteristics are somewhat different from that of rural areas and that the epidemiological features are undergoing a change and the disease is invading the towns and the industrial areas.

5. *Possibility of leprosy being infectious long before it is conspicuous*—The incubation period of leprosy could not be definitely established unlike other diseases, but roughly it has been estimated as 2-4 years by different workers. It is possible that the individual may harbour the infection for an indeterminate period before clinical manifestation. Lara and Nolasco (*loc. cit.*) postulated the theory of spontaneous healing in a large majority of cases of early childhood and thus the clinical evidence appears following periods of stress and strain or physiological changes, as in puberty, pregnancy, menopause and intercurrent and complicating diseases, somewhat in the line of tuberculosis. Badger (*loc. cit.*) has suggested that even one contact under ideal condition may be sufficient to give the infection as in tuberculosis (Lal *et al.*, 1943), although the disease, in reality, may be only mildly infective.

6. *Position of social ostracism in urban communities*—In Calcutta nearly all the patients were accommodated in their own homes or others' houses, but in most instances it may be that the inmates were unaware of the disease affecting the person. The field visits, however, confirmed the opinion that with the introduction of the successful treatment, particularly in the early stages (before any sign of deformity arises) a tendency towards toleration has been slowly growing and it is up to the organisers of leprosy control work to seize the opportunity to allay the fears and to remove the superstitious beliefs and social stigma hindering the control work.

CONCLUSIONS

This study has shown that the social factors play some significant role in the epidemiology of leprosy and as such these should be taken into consideration in the planning of control measures. The disease is endemic in Calcutta and its epidemiological features differ from those of rural areas in certain respects. In this city the higher age groups are relatively more affected than the children, and more or less all shades of social, economic, religious and cultural groups are affected. Another feature is that the children suffer more from non-lepromatous leprosy than lepromatous variety (Tables 2 and 3). Thus, they seem to be partially protected (? passive resistance from the mothers). Although there is some migration of patients from outside the city for treatment the source remained unknown in as high as 90-91 per cent of the patients and was not detected even after careful investigation due to several handicaps such as, the absence of the method of cultivation of the organism, difficulty in assessing the incubation period and often suppressed clinical manifestation. Besides, the city provided enormous opportunities for unknown exposure due to extreme overcrowding and movement of population.

SUGGESTIONS FOR CONTROL MEASURES

(a) *With reference to Calcutta and urban areas*—

(1) A multipronged attack is the first necessity.

(2) An intensive epidemiological study should be undertaken simultaneously by a well-equipped and well-organised team of workers in collaboration with the existing leprosy clinics and institutions in the city, to detect early cases and to deal with

their contacts, so that only domiciliary *cum* clinic treatment can quickly restore them to normal health and avoid the problem of deformity and complications as much as possible. Thus, the social stigma which generally originates from deformity can be removed.

(3) The pocket of leprosy such as in the industrial establishment and the workers' living barracks, or huts or bustee areas in the city or town should be detected and intensive anti-leprosy campaign through establishment of clinics, field work and health education measures should be organised. Steps should also be taken to rehabilitate the patients as soon as they are bacteria-negative or declared cured.

(4) The Leprosy Hospital of the city should be re-established and renamed as Hospital for Skin Diseases or Dermatological Hospital with facilities for treatment of infectious cases, plastic surgery, trial of new drugs and a full fledged physiotherapy section for rehabilitation.

(5) All medical trainees should compulsorily attend specific number of lectures and demonstrations on both preventive and curative aspects of leprosy and should be examined on the subject as in tuberculosis.

(6) The department of Preventive and Social Medicine should deal with the social and psychosocial aspects of the disease to orient the students to fight against ignorance, false beliefs and social stigma which have so far stood in the way of adequately dealing with the problem.

(7) Suitable incentive should be given to trained medical personnel and social workers to take up leprosy work as a career.

(b) *Other measures for rural and urban areas*—(1) A dermatological clinic for treatment of leprosy and other skin diseases should form an integral part of all rural and urban health centres, dispensaries and polyclinics, to be held at least one day a week so that the patients may receive treatment as a member of their family nearest to their homes.

(2) The Survey, Health Education and Social Services units should be dovetailed with the common health services programme. The epidemiological cell of the State Health Department should collaborate with the leprosy cell to organise studies and field trials of drugs, vaccines, etc. and also in the various research projects related to both internal and external factors influencing the transmission and spread of the disease.

(3) The mobile dispensaries which have been proposed to be introduced for general purpose may allot a special day in the week for treatment of all skin infection including leprosy.

(4) The above arrangements may be supplemented by suitably located vocational training and social services centre for rehabilitating patients with deformities.

(c) *Legal measures*—A model central act on leprosy should be promulgated by the Parliament not only to protect the society from the leprosy infection but also to give adequate protection to the persons suffering from leprosy and to arrange for their treatment and rehabilitation.

(d) *Role of voluntary organisations*—(1) As the success of the campaign against leprosy largely depends on the collaboration of the voluntary agencies and co-operation of the people concerned the Government agencies should co-ordinate all leprosy work in the country and organise frequent exchange of views on common problems of the disease between them.

(2) The Indian Medical Association, as a professional organisation, should urge upon all medical practitioners to treat leprosy patients like any other patients in their clinics, if necessary by special arrangement.

(3) The voluntary organisations, irrespective of their direct or indirect concern with anti-leprosy work, should offer their help and co-operation to the governmental agencies and plans, as they are now doing for family planning

ACKNOWLEDGMENT

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2

A Serological Survey of ARBO Virus Antibodies in the Children of Indore (M.P.)

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In 1958, the team of the Virus Research Centre, Poona, conducted a serological survey of adults in Indore and its surrounding areas. They discovered, by HI and CF tests, ARBO virus group B —HI antibodies in 16 to 83 per cent of the area in various localities, the highest titre being against the dengue and the CF antibodies in 0 to 24 per cent sera and suggested that dengue and a member of WN and JBE complex were active in this area.

In this study, an atttmpt has been made to find out if there was any serological evidence of the existence of ARBO virus infection among the children of Indore.

MATERIAL AND METHOD

Sixty-six samples of sera were obtained from the children up to the age of 12 years, irrespective of their complaints, attending the OPD of the M. Y. Hospital, Indore. They were investigated at the Queensland Institute of Medical Research, Brisbane, Australia, for evidence of ARBO virus antibodies by HI and CF tests. Those sera which were positive for HI and/or CF antibodies, were also tested by the plaque inhibition test in the PS cell monolayers and by neutralisation test in the baby mice.

Haemagglutination inhibition test (HI)—It was performed on all the 66 sera, employing sucrose-acetone extracted mouse brain antigens (Clarke and Casals, 1958), actone-ether extracted sera (Porterfield, 1954) and goose red blood cells. Antigen to Getah virus was used after its treatment with protamine and to Ross River, was prepartd by acetone extraction and protamine treatment of the mouse serum (Clarke and Casals, *loc. cit.*). The antigens were supplied by the Queensland Institute of Medical Research, Brisbane (Table I). One of the sera (8) was employed after acetone-ether extraction as well as after its treatment with kaolin for Kongal and Wongal virus antigens.

TABLE I—SHOWING ANTIGENS EMPLYOYED IN DIFFERENT TESTS

Antigen	Strain	Tests for which used
Sindbis	MRM 39	HI-S
Getah	N 544	HI-S
Ross River	T 48	HI-S ; Neut.
Kongal	MRM 97	HI-S
Kongal	MRM 31	Neut.
Wongal	MRM 168	HI-S ; Neut.
MVE	MRM 66	HI-S ; HI-T ; CFT ; PIT
D 1	Hawaii	HI-S ; HI-T ; CFT ; PIT
D 2	New Guniea C	HI-S ; HI-T ; CFT ; PIT
D 3	H-87	HI-S ; HI-T ; CFT ; PIT
D 4	H-241	HI-S ; HI-T ; CFT ; PIT
JBE	Nakayama	HI-S ; HI-T ; CFT ; PIT
Kunjin	MRM 16	HI-S ; HI-T ; CFT ; PIT
Stratford	C-338	HI-S ; HI-T ; CFT
SLE	Hubbard	HI-S ; HI-T
Edgehill	C-281	HI-S ; HI-T ; CFT ; PIT
Kokobara	MRM 32	HI-S ; CFT
WNV	Sarafend	CFT ; PIT
Corriparta	MRM 1	CFT-S
Maputta	MRM 186	CFT-S
?	MRM 1074	CFT-S
?	MRM 1178	CFT-S

HI-S =Haemagglutination inhibition screening test.
HI-T =Haemagglutination inhibition titration test.
PIT =Plaque inhibition test.
CFT =Complement fixation titration test.
CFT-S=Complement fixation screening test.

HI screening test—All the 66 samples of sera were tested in 1/20 dilution against MVE, Sindbis, Getah, Ross River, Kongal and Wongal virus antigens. Sera which were found negative with these antigents were again screened against D1, D2, D3, D4, JBE, Kunjin, SLE, Stratford, Edgehill and Kokobara virus antigens.

HI titration test—The five sera (34, 63, 65, 78 and 82) which were found to be positive for HI antibodies at the screening test against MVE antigen, were titrated for HI antibodies against MVE, JBE, D1, D2, D3, D4, SLE, Kunjin, stratford and

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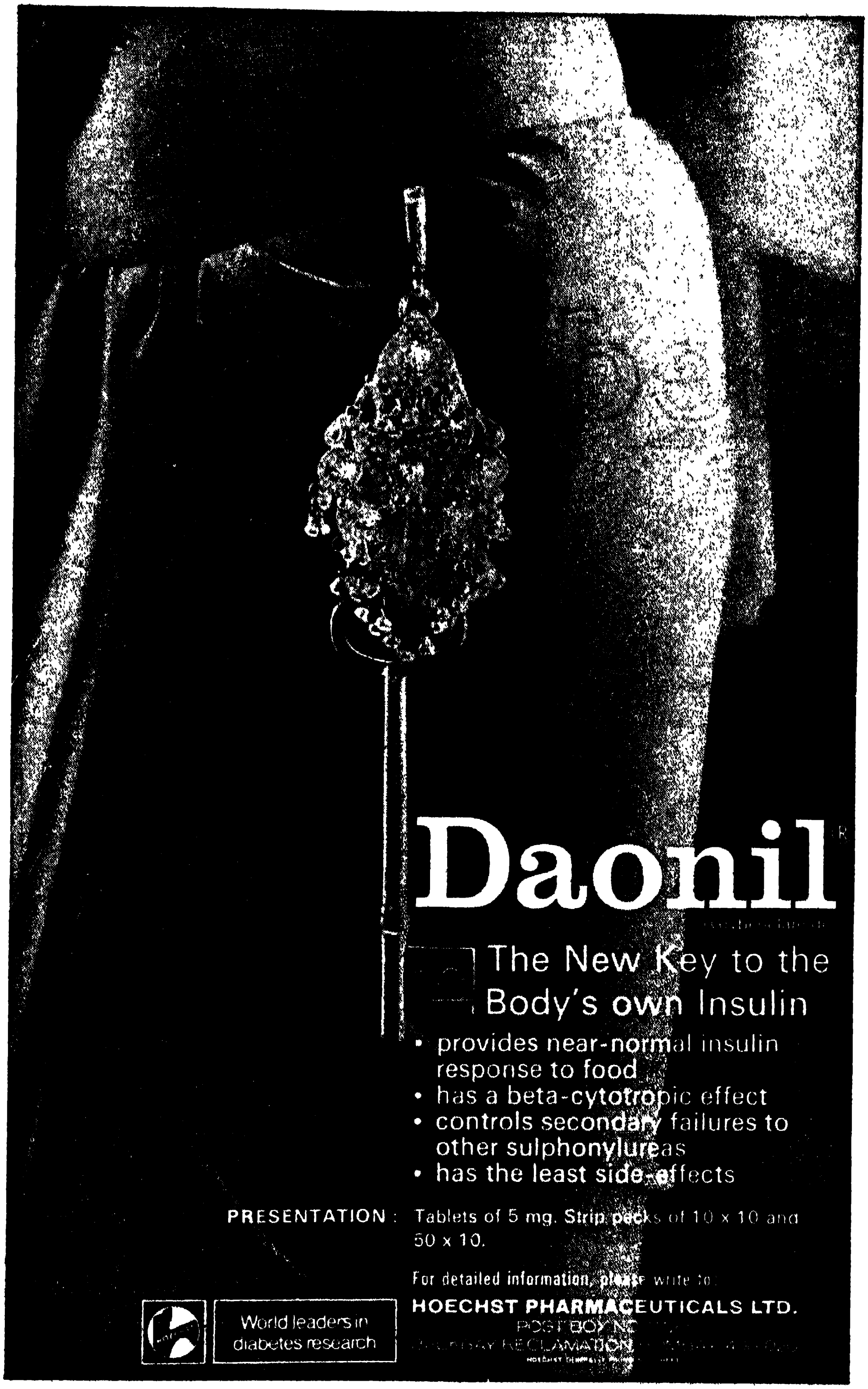

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Edgehill virus antigens. Serum 8 was titrated against Kongal antigen.

Complement fixation test (CFT)—It was performed by the micromethod described by Doherty *et al.* (1964). The results were read as: complete haemolysis=0 ; No haemolysis=4 ; and 0 to 4 as per the gradation of haemolysis. The 61 samples of sera, negative for HI antibodies were screened by CFT against Corriparta, Maputta, MRM 1074 and MRM 1178 virus antigens and also against normal mouse brain antigen. The other 5 sera (34, 63, 65, 78 and 82) which showed evidence for HI antibodies, were titrated by CFT against D1, D2, D3, D4, Stratford, JBE, WNV, MVE, Kokobara and Kunjin virus antigens (strains of the viral antigens were the same as for the HI test). None of the sera, screened by CFT was positive and hence was not titrated.

Plaque inhibition test (*PIT*)—Five sera which showed presence of HI antibodies and four HI antibody negative sera were tested by PIT in PS cell monolayers against D1, D2, D3, D4, JBE, Kunjin, MVE and WNY virus antigens. This test was done by the technique of Porterfield (1960). The results were read after 48 hours except for D1 where the results were read after 4-5 days, as it was slow to grow. The plates with an adequate number of plaques were stained with neutral red solution. The zones of inhibition were marked and their average diameters were measured.

Neutralisation test in baby mice—One serum, showing evidence for the presence of HI antibodies for Kongal and Wongal antigens, has been investigated for neutralising antibodies in baby mice by the technique described by Doherty *et al.* (*loc. cit.*). The antigen-serum mixtures were inoculated intracerebrally in amounts of 0·015 ml. The animals were observed for any deaths or sickness up to 14 days.

RESULTS

HI test—Only 5 sera (7·57 per cent) showed evidence of various group B—HI antibodies, in titres ranging from 1/20 to 1/320. Sera 34 and 63 had only one typye of HI antibodies and the remaining sera had more than one types of HI antibodies. Group A—HI antibodies were seen only in one serum (8) (1·5 per cent) against Kongal and Wongal antigens (Table 2).

CF test—The sixty-one sera, negative for HI antibodies, also did not show any CF antibodies against Corripata, Maputta, MRM 1074 and MRM 1178 viral antigens. Of the 5 samples of sera, positive for B group HI antibodies, only 4 sera showed evidence of CF antibodies against various viral antigens, in titre of 1/8 (Table 3).

TABLE 2—SHOWING THE RESULTS OF HI TITRATION TEST

Serum (No.)	Age (years)	Sex	Group B viral antigens									
			MVE	JBE	Kunjin	SLE	D1	D2	D3	D4	Stratford	Edgehill
34	8	F	—	—	—	—	—	—	—	1/20	—	—
63	1	F	1/20	—	—	—	—	—	—	—	—	—
65	8	M	1/320	1/40	1/20	1/40	—	1/20	—	—	1/20	1/80
78	1/3	F	1/20	—	—	—	—	1/20	—	—	—	1/20
82	4	F	1/160	—	—	—	—	—	—	—	—	1/80

TABLE 3—SHOWING CF TITRATION RESULTS OF THE 5 HI POSITIVE SERA

Serum (No.)	Age (years)	Sex	Group B viral antigens									
			D1	D2	D3	D4	Edgehill	WNV	MVE	Kokobara	Kunjin	JBE
34	8	F	—	1/8	—	—	—	—	—	—	—	—
63	1	F	—	—	—	1/8	—	1/8	—	—	1/8	—
65	8	M	—	—	—	—	—	+—	+—	—	—	+—
78	1/3	F	—	+—	—	—	—	—	—	—	—	—
82	4	F	—	—	—	—	—	—	—	—	1/8	+—

Plaque inhibition test—Five samples of sera, positive for HI-antibodies and another 4 samples of sera, negative for both the HI and CF antibodies, were investigated by this method. Only three samples of sera gave positive results (Table 4).

TABLE 4 SHOWING THE RESULTS OF THE PLAQUE INHIBITION TEST

Virus	Dilution	Group B HI antibodies positive sera				
		34	63	65	78	82
D1	$10^{-3.0}$	—	—	—	—	—
D1	$10^{-3.5}$	—		—	—	—
D2	$10^{-3.0}$	—	+—	—	—	—
D2	$10^{-3.5}$	—	—	—	—	—
D3	$10^{-3.0}$	—	—	—	—	—
D3	$10^{-3.5}$	—	—	—	—	—
D4	$10^{-4.0}$	T	—	—	—	—
D4	$10^{-4.5}$	—	—	—	—	—
JBE	$10^{-1.0}$	—	—	+—	—	—
JBE	$10^{-1.5}$	—	—	—	—	—
Kunjin	$10^{-3.5}$	—	—	—	—	—
Kunjin	$10^{-4.0}$	—	—	—	—	—
MVE	$10^{-4.0}$	—	—	9 mm	—	—
MVE	$10^{-4.5}$	—	7 mm	8 mm	—	—
WNV	$10^{-4.5}$	—	—	—	—	—
WNV	$10^{-5.0}$	—	13 mm	14 mm	9 mm	—
WNV	$10^{-5.5}$	—	—	—	—	—
Edgehill	$10^{-4.0}$	—	—	—	—	—

The four HI and CFT negative sera did not show inhibition of plaque formation with any of the viral antigens.

Neutralisation test—Serum 8 tested against the Kongal and the Wongal viral antigens gave negative results.

An analysis of all the tests done shows that all the five sera showed evidence of the presence of antibodies against more than one viral antigens and more than one type of antibodies (Table 5).

COMMENTS

Of the 66 samples of sera from the children up to the age of 12 years investigated, only 7·57 per cent of them showed evidence of the presence of the B group ARBO virus antibodies HI antibodies in titres of 1/20 to 1/320 and CF antibodies in titres of 1/8. Plaque inhibiting antibodies were detected only in 3 sera against MVE, WNV, D2 and JBE viral antigens. Group A antibodies, though shown by HI test in one serum, could not be confirmed by the neutralisation test. Among these few positive sera, antibodies against various B group ARBO viruses as dengue, SLE, MVE, WNV, JBE, Kunjin, Edgehill and Stratford were seen in one or more than one serum (Table 6) and by one or the other test (Tables 5 and 6). Further the same serum showed the presence of antibodies against more than one viral antigen (Table 5). These observations suggest the possibility of a focus of group B—ARBO virus infection in this area but the proportion of infection among the children is not high. The Virus Research Centre, Poona also suggested, in their report of 1958, that a dengue and WNV-JBE complex were active in the area of Indore and its surrounding areas.

TABLE 5—SHOWING AN ANALYSIS OF THE VARIOUS ANTIBODIES IN THE FIVE HI ANTIBODY POSITIVE SERA

Serum No.	Viral antigen	Positive test	Titre of antibodies
34	D2	CFT	1/8
	D4	HI	1/20
63	MVE	HI PIT	1/20 weak positive (7 mm.)
	WNV	CFT PIT	1/8 strong positive (13 mm.)
65	MVE	HI CFT PIT	1/320 +— strong positive (9 mm.)
	JBE	HI CFT	1/40 +—
	WNV	PIT	strong positive (14 mm.)
78	MVE	HI	1/20
	D2	HI CFT	1/20 +—
	Edgehill	HI	1/20
82	MVE	HI	1/160
	Edgehill	HI	1/80

TABLE 6—SHOWING THE INCIDENCE OF VARIOUS ANTIBODIES IN THE 66 SERA

Virus	HI test			CF test			Plaque inhibition test		
	+ Sera		Titre	+ Sera		Titre	+ Sera		Inhibition diameter (mm.)
	No.	Per cent		No.	Per cent		No.	Per cent	
MVE	4	6·0	1/20-1/320	1	1·5	+--	2	3·0	7-8
JBE	1	1·5	1/40	2	3·0	+—	1	1·5	+—
Kunjin	1	1·5	1/20	2	3·0	1/8	0	0	--
SLE	1	1·5	1/40	not done			not done		
D2	2	3·0	1/20	2	3·0	+—1/8	1	1·5	+--
D4	1	1·5	1/20	1	1·5	1/8	1	1·5	T
Stratford	1	1·5	1/20	not done			not done		
Edgehill	3	4·5	1/20-1/80	0	0		0	0	—
WNV	not done			2	3·0	+--1/8	3	4·5	9-13

SUMMARY

Sixty-six samples of sera from children, up to the age of 12 years, from Indore have been investigated for evidence of ARBO virus antibodies by HI test, CF test, plaque inhibition test and neutralisation test.

Five samples of these sera showed evidence of HI antibodies against various B group ARBO viral antigens. Of these five sera, CF and plaque inhibiting antibodies could be demonstrated only in 4 and 3 samples respectively.

The findings are suggestive of the possibility of the presence of a B group ARBO virus focus in Indore and its surrounding areas, though the incidence of infection among the children of this area, does not seem to be high.

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3

Ocular Lesions in Leprosy

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Eye lesions in leprosy are due to direct involvement of the ocular structures by *Myco leprae* and secondary infection following exposure of the cornea consequent to 5th or 7th cranial nerve paralysis and sensitivity to leprosy activity elsewhere in the body. The frequency of ocular involvement of leprosy reported by different authors of different parts of the world shows variations from 6·3 per cent to 100 per cent (Table 1). The common ocular findings reported, in order of frequency, are madarosis, nodular hypertrophy of the skin of eye lids, corneal lesions, iridocyclitis and paralysis of 5th and 7th cranial nerve.

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TABLE 1—SHOWING THE INCIDENCE OF OCULAR MANIFESTATIONS OF LEPROSY REPORTED BY VARIOUS AUTHORS

Authors	Percentage
Lepez (1889), U.S.A. ...	100
Borthen and Lie (cited by Pendergast, 1940), Leipzig ...	82
Neve (1900), Kashmir	25
Woods (1925), U.S.A. ...	100
Rogers (1927), U.S.A.	100
King (1936), U.K.	71
Pendergast (1940), U.S.A.	91
Harley (1946), Panama	30
Kirwan (1955a, b), Bengal	100
Woods (1961), U.S.A.	60-90
Weerekoon (1969), Ceylon	47
Present series (1972), Assam	80

CLINICAL ASPECT :

Eyes of 45 patients of a leprosarium near Gauhati were examined. Depending upon the general lesions, the cases were divided into (a) lepromatous and (b) non-lepromatous group. Thorough ocular examination was done including testing of corneal sensation and assessment of intra-ocular pressure. Corneal sensation was tested by touching the cornea with a fine cotton wool. Detailed fundus examination was attempted in all the patients after dilating the pupil with 10 per cent phenylephrine drops. The ocular findings met with in lepromatous and non-lepromatous groups were recorded separately.

OBSERVATIONS

There were 36 male patients, 22 of whom were of lepromatous type and 14 of non-lepromatous type. Of the 9 female cases, 5 were of lepromatous type and 4 of non-lepromatous type. All the patients were having dapsone (D.D.S.) in proper therapeutic dose for periods varying from 7 months to 7 years. The patients were between the ages of 25 years and 60 years but most of them were between 40 and 60 years of age (Table 2).

TABLE 2—SHOWING THE AGE AND SEX DISTRIBUTION OF 45 CASES OF LEPROSY

Age group	Male		Female		Total
	Lepromatous	Non-lepromatous	Lepromatous	Non-lepromatous	
20—30	3	—	—	—	3
31—40	4	1	3	3	11
41—50	6	7	1	1	15
51—60	9	6	1	—	16
Total	22	14	5	4	45

Corneal lesions—Corneal lesions were found in 9 cases of lepromatous group and 4 cases of non-lepromatous group constituting 29 per cent of the total cases. Both cornea were equally and almost identically involved. Corneal lesions mainly consisted of dusty scattered punctate white opacities over the entire cornea. In four cases the corneal lesion was associated with healed anterior uveitis. Three eyes were found to be blind due to occlusio pupillae. There was only one case of typical lepromatous pannus. Loss of corneal sensation was found in 6 cases and the incidence was equally common both in lepromatous and non-lepromatous groups. Out of these six cases, in four there was loss of sensation of tip of the nose also (Table 3).

TABLE 3—SHOWING THE INCIDENCE OF MAIN OCULAR LESIONS OF LEPROSY IN LEPROMATOUS AND NON-LEPROMATOUS GROUP

Lesion	In lepromatous group (%)	In non-lepromatous group (%)
Madarosis and loss of eye brows ...	26	17
Loss of sensation of cornea and tip of the nose ...	11	17
Corneal opacity ..	33	22
Anterior uveitis ...	15	17

Involvement of skin—The involvement of skin of the forehead and eyelids was found in 7 cases of lepromatous group and 3 cases of non-lepromatous group and taking both groups together the incidence was 22 per cent. The commonest finding was loss of eyelashes and eyebrows with nodular hypertrophy of the skin of the eyelids (Fig. 1). Typical leonine facies of lepromatous leprosy was found in one case (Fig. 2). An extensive lepromatous patch (tuberculoid major) involving one side of the face extending from the pinna of the ear to the eyelids was found.

Scarring of the skin of lid margins and depigmented patches were not found in any of the cases. Intra-ocular pressure was normal in all the cases.

Fundus examination—Fundus examination revealed some abnormalities in 14 cases of which 7 may be atributed to leprosy. Out of these seven cases one had peripheral healed patch of chroiditis which could be due to leprosy. In six cases mott-

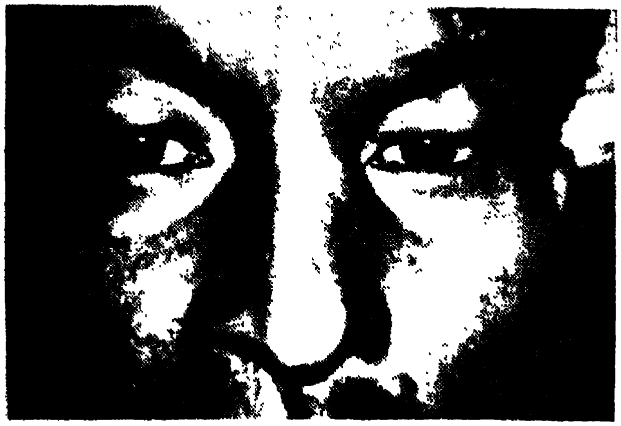

FIG. 1—SHOWING NODULAR HYPERTROPHY IN LEPROSY

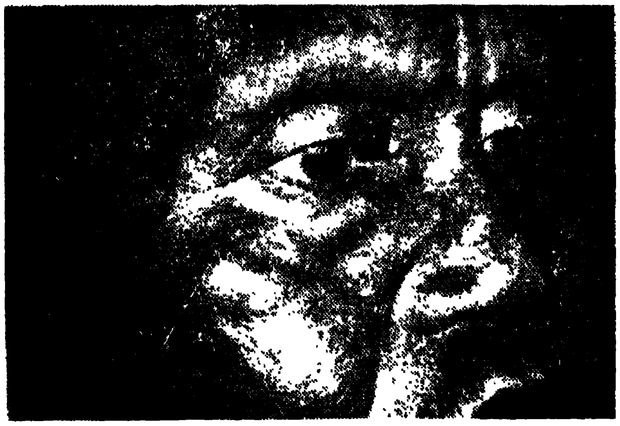

FIG. 2—SHOWING LEONINE FACIES

ling appearance of the macular area was associated with some degree of pigment disturbance. This appearance is highly suggestive of healed central retinopathy due to leprosy activity elsewhere in the body. Other changes were as follows : Macular degeneration (1), pigment over the disc (congenital) (1), blurred disc margin (1), patch of haemorrhage (1), healed peripheral choroiditis (1), colloids body in the fundus (1) and thrombosis of retinal veins (1).

Excessive conjunctival pigmentation—Excessive conjunctival pigmentation near the inner canthus and limbus and heavily pigmented skin of the lids were found in 3 cases.

Two female cases of non-lepromatous group had bilateral facial nerve paralysis.

COMMENTS

Whatever be the mode of involvement, leprosy in its natural course invariably affects the eyes and unless its progress is interrupted by treatment it leads to blindness as a result of corneal lesion or uveal tract involvement. in lepromatous type, corneal and uveal tract involvement results from the actual presence of the organisms in these tissues but in non-lepromatous type the lesions are secondary (De Barros, 1946). The mode of entry of the lepra bacilli into the cornea is not definitely known but any of the following routes may be possible . (a) By diffusien from the periphery of the cornea, (b) through the ciliary body to the aqueous humour, (c) along the nasociliary branch of the ophthalmic division of 5th nerve and (d) from adjacent structures like the eyelid and the nose. Lepromatous nodules are formed in the cornea and iris ; in the cornea it is manifested as 'flour dust' or 'chalk dust' type of corneal opacity and in the iris they are classically described as "Iris pearls". In addition to this, the corneal lesions may be like interstitial keratitis due to diffuse opacification of deeper layers of the cornea with some amount of vascularisation. Further, anaesthesia of the cornea and its exposure due to paralysis of the facial nerve may also affect the cornea (Elliot, 1920). Absolute anaesthesia of the cornea is rare but relative loss of corneal sensitivity commonly occurs.

Iridocyclitis may be due to the actual presence of the organism or due to toxic effect of dapsone. Fundus lesions in leprosy are reported to be very rare (Van Poole, 1936 ; Somerset and Sen, 1956). But in our series there were 7 cases of fundus lesion which could be due to leprosy. Excessive pigmentation of the conjunctiva and the skin of the eyelids in leprosy were not reported before. There were 3 cases of excessive pigmentation in this series. This was present both in lepromatous and in non-lepromatous group. This may be due to modification of pigment metabolism by dapsone.

SUMMARY

Eyes of 45 patients suffering from leprosy were examined. The incidence of eye lesions of both lepromatous and non-lepromatous type was almost equal. Madarosis and corneal involvement were found to be more common in lepromatous group than in non-lepromatous one. The incidence of neural lesion and uveal tract invovement were more in non-lepromatous group than in lepromatous group. Excessive pigmentation of the skin around the eye and conjunctiva were found in 3 cases. Seven cases of chrioretinal lesions and 2 cases of facial nerve paralysis were observed.

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4

Salbutamol†

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Since adrenaline was used as a spray in asthma by Mathews (1910), several drugs have been in use to give relief in bronchospasm. These are: Isoprenaline (Konzett, 1940; Ahlquist, 1948), orciprenaline (Engelhardt *et al.*, 1961; Shanks *et al.*, 1967) and disodium cromoglycate (Altounyan, 1967; Howell and Altounyan, 1967a, b; Clarke, 1971). Salbutamol is a recently discovered drug and had been claimed to be very effective to relieve bronchospasm (Kennedy and Simpson, 1969; Choo-Kang *et al.*, 1969; Kamburoff and Prime, 1970; Palmer *et al.*, 1970; Warrel *et al.*, 1970). This drug was reported to be well tolerated and had no untoward effect in the human body.

Although the drug is not yet available in India, the preliminary trials from abroad was sufficiently encouraging to arrange for a "double-blind" and "cross-over" study between ephedrine and salbutamol. This paper summarises the finding of our trial (conducted between May and December, 1971).

Salbutamol is a β_2-adrenergic stimulator. It is a saligenin derivative of phenylethylamine and is chemically related to both adrenaline and isoprenaline.

The product was synthesised by Hartley *et al.* (1968) and tried by Brittain *et al.* (1968) and was reported after considerable animal experiments.

Unlike isoprenaline, it is not rapidly inactivated by C.O.M.T. and animal experiments showed very little cardiac stimulation (Cullum *et al.*, 1969). Weight for weight, it is 20-40 times more powerful than orciprenaline. It has been reported to promote evacuation of bronchial mucus (James, 1970). It acts selectively on bronchial smooth muscle and spares the vascular smooth muscle (Cullum *et al.*, *loc. cit.*).

MATERIAL AND METHOD

As regards bronchial asthma, it is defined as episodes of bronchospasm with symptomless interval in between attacks initially. In the trial, we accepted people only with a history of continuous bronchospasm for at least a month prior to the trial to facilitate the interpretation of results. Children under 10 were excluded as they could not co-operate during lung function studies.

All patients had persistent bronchospasm when the trial started. Forced expiratory volume in 1 second (F.E.V.$_{1\cdot0}$) was estimated by a respirometer and expirograph. One per cent isoprenaline was given as inhalation (two puffs) and F.E.V.$_{1\cdot0}$ was repeated. If the improvement in F.E.V.$_{1\cdot0}$ was 20 per cent or moreover the initial value, the patient was included in the study, provided that he/she did not have steroid during the past one month.

All drugs were withdrawn for 2 days on selected cases. Each case was then thoroughly examined and records were entered in printed/cyclostyled cards. Each symptom and sign was given a score, according to a pre-determined chart for scoring (all the symptoms scored a maximum point of 18; all signs a maxmum point of 10). These patients were then randomised (following the method of Hill, 1959) either to salbutamol or ephedrine therapy. All the clinical recordings were done by the two authors who examined the cases clinically every week; lung functions were undertaken by a second group who knew nothing about the therapy. The third group studied pathological reports and roentgenograms of chest. The medical statistician analysed the results when the trial was over. ECG reports were analysed by another group. The identity of the tablets were kept a secret by the company from where drugs were received. All improvements noticed were recorded weekly and scored and the total for each week was expressed as per cent improvement or deterioration over the initial score.

Each of the following symptoms and signs was assessed and scored initially and then weekly for 4 weeks: Nocturnal dyspnoea, wheezing attacks, exertional dyspnoea, tightness of the chest, cough, sputum quantity, time off-work, rhonchi, other signs of air-way obstruction, pulse and blood pres-

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† The summary was presented in a Medical Conference on Salbutamol in Calcutta on 3rd April, 1972.

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sure. Patients recorded their daily progress in a separate sheet and remarked their condition as "W" (worse), "N.C." (no change), "I" or "G.I." (improved/greatly improved) as compared to the previous week.

Peak flow was estimated by Wright's peak-flow meter. F.E.V.C. (forced expiratory ventilatory capacity) and F.E.V.$_{1.0}$ were measured by the Wright's respirometer and later by expirograph. E.F.R. was estimated as $\frac{\text{F.E.V.}_{1.0} \times 100}{\text{F.E.V.C.}}$. All estimations except F.E.V.$_{1.0}$ were undertaken thrice and mean recorded for each week for 4 successive weeks; F.E.V.$_{1.0}$ was recorded weekly once only.

The following investigations were undertaken at the beginning and again at the end of the trial (normal ranges are given within parenthesis); total and differential WBC count, haemoglobin, P.C.V., urine for routine examination and microscopy, blood urea (normal 15-40 mg. per cent) and N.P.N. (20-35 mg. per cent); alkaline phosphatase (5-12 units), serum bilirubin (0·1-0·6 mg. per cent), SGOT (5-20 I.U.), P-A view of x-ray of the chest and a standard 12 lead ECG. Methods followed in the biochemistry department were those of Wootton (1964).

At the end of 2nd week of therapy, the patients were switched over to the other tablet in identical dosage (i.e., those receiving ephedrine 30 mg. tablets first now received salbutamol 2 mg. tablets and *vice versa*). Since the tablets were identical, the change in therapy ("the cross-over") was never detected by the patients. The dosage used was 1-2 tablets thrice daily (patients under 45 kg., received one tablet thrice daily and those above received double the dose daily). The following classification of results were made (based on the basal and initial score) :

Up to 25 per cent improvement—poor, 26-50 per cent improvement—moderate, 51-75 per cent improvement—good, over 76 per cent improvement excellent.

A total of 57 cases were admitted in the trial but 17 cases were excluded from the final analysis for the following reasons : 8 patients : Concomittant drug therapy (i.e self-administration of the trusted tablets) and wrong inclusion (4 in ephedrine treated group had to take aminophylline and orciprenaline in the first 2 weeks and 2 in salbutamol group needed steroid) ; 2 cases had episodic attacks, as revealed by further enquiry, while the trial was on.

2 patients developed status asthmaticus and left the trial, 3 patients for irregular attendance/severe side effects, 2 patients completed the trial but did not complete the investigation, 1 patient lost records, and 1 patient for irregular drug intake.

Each person vacating the random schedule was replaced by a new patient taking that number. So 40 cases were left for final analysis ; twenty starting initially on salbutamol and the other twenty on ephedrine.

RESULTS

All the results in this series are described in 4 separate groups and tables, each analysing the patients receiving either ephedrine or salbutamol for the respective weeks.

Improvement in symptoms (Table 1)—Ini-

TABLE 1—SHOWING COMPARATIVE RESULTS OF SYMPTOMATIC RESPONSE TO SALBUTAMOL AND EPHEDRINE
TOTAL NO. 40 CASES: 20 IN EACH GROUP

Switch over

Grade of improvement	1st week Sal.	 Eph.	2nd week Sal.	 Eph.	3rd week E-Sal.	 S-Eph.	4th week E-Sal.	 S-Eph.
Excellent	9 (45%)	3 (15%)	10 (50%)	5 (25%)	12 (60%)	5 (25%)	13 (65%)	11 (55%)
Good	1 (5%)	3 (15%)	3 (15%)	5 (25%)	6 (30%)	8 (40%)	3 (15%)	5 (25%)
Moderate	2 (10%)	2 (10%)	3 (15%)	5 (25%)	2 (10%)	4 (20%)	4 (20%)	2 (10%)
Poor	8 (40%)	12 (60%)	4 (20%)	5 (25%)	0 (Nil)	3 (15%)	0 (Nil)	2 (10%)

Sal.=Salbutamol-treated cases (1st, 2nd weeks); Eph.=Ephedrine-treated cases (1st, 2nd weeks); E-Sal.=Initial ephedrine group now treated by salbutamol; S-Eph.=Initial salbutamol group now treated by ephedrine.

TABLE 2 SHOWING COMPARATIVE RESULTS OF IMPROVEMENT IN SIGNS WITH SALBUTAMOL AND EPHEDRINE
TOTAL NO. 40 CASES: 20 IN EACH GROUP

					Switch over			
Grade of improvement	1st week		2nd week		3rd week		4th week	
	Sal.	Eph.	Sal.	Eph.	E-Sal.	S-Eph.	E-Sal.	S-Eph.
Excellent	5 (25%)	3 (15%)	6 (30%)	3 (15%)	9 (45%)	5 (25%)	13 (65%)	8 (40%)
Good	2 (10%)	2 (10%)	5 (25%)	5 (25%)	3 (15%)	5 (25%)	5 (25%)	2 (10%)
Moderate	5 (25%)	7 (35%)	5 (25%)	8 (40%)	5 (25%)	3 (15%)	0 (Nil)	5 (25%)
Poor	8 (40%)	8 (40%)	4 (20%)	4 (20%)	3 (15%)	7 (35%)	2 (10%)	5 (25%)

TABLE 3 SHOWING COMPARATIVE RESULTS OF RESPONSE OF E.F.R. WITH SALBUTAMOL AND EPHEDRINE
TOTAL NO. 40 CASES: 20 IN EACH GROUP

					Switch over			
Grade of improvement	1st week		2nd week		3rd week		4th week	
	Sal.	Eph.	Sal.	Eph.	E-Sal.	S-Eph	E-Sal.	S-Eph.
Excellent	Nil		Nil		Nil		Nil	
Good	Nil		Nil		Nil		Nil	
Moderate	6 (30%)	1 (5%)	8 (40%)	5 (25%)	9 (45%)	3 (15%)	8 (40%)	3 (15%)
Poor	14 (70%)	19 (95%)	12 (60%)	15 (75%)	11 (55%)	17 (85%)	12 (60%)	17 (85%)

tially, ephedrine caused a mean improvement of 33 per cent in 1st week (range nil to 100 per cent). This showed a steady rise to 50 per cent in the 2nd week. Switch-over to salbutamol caused 78 per cent improvement in the 3rd and 4th weeks. Salbutamol maintained an initial advantage of 49 per cent and 59 per cent, which became 62 per cent and 72 per cent in the next 2 weeks when ephedrine was given. Thus, the improvement was more marked in salbutamol group all along except in the 4th week, when ephedrine also showed equally good response.

Improvement in signs—Ephedrine was less efficacious than salbutamol in 1st, 2nd weeks (ephedrine 40 per cent and 49 per cent and salbutamol 50 per cent and 57 per cent respectively). After the switch-over, on the 3rd week ephedrine group showed a fall to 54 per cent while on 4th week salbutamol (78 per cent) showed marked advantage over ephedrine (59 per cent). Thus, some improvement was more marked in the salbutamol all along (Table 2), both before and after the switch over and it was statistically significant in the fourth week (at 5 per cent level).

Improvement in E.F.R.—Only E.F.R. figures are analysed in details, as these represent both $F.E.V._{1\cdot0}$ and F.E.V.C.

None of the patients in either group showed either excellent or good results, which might have been due to the shortness of the trial and long history of illness in the individual patient. Improvement was more marked in the salbutamol group in all the 4 weeks i.e., both before and after switch-over (Table 3). The initial lead maintained by the mean improvement in salbutamol dropped sharply on giving ephedrine. Somewhat better improvement was noticed in the ephedrine treated group in the 4th week. There was no statistically significant difference between either group due to low rise in functions.

Improvement in E.P.F.—Along with good symptomatic improvement and lessening of objective signs, the functional improvement, as evidenced by absolute rise in E.P.F., was also evident in both groups. Poor results were however obtained in nearly a quarter of patients in either group (Table 4). The mean improvement was markedly better in

TABLE 4—SHOWING COMPARATIVE RESULTS IN E.P.F. WITH SALBUTAMOL AND EPHEDRINE
TOTAL NO 40 CASES: 20 IN EACH GROUP

	Switch over							
Grade of improvement	1st week		2nd week		3rd week		4th week	
	Sal.	Eph.	Sal.	Eph.	E-Sal.	S-Eph.	E-Sal.	S-Eph.
Excellent	4 (20%)	1 (5%)	6 (30%)	5 (25%)	7 (35%)	5 (25%)	6 (30%)	7 (35%)
Good	0 (Nil)	1 (5%)	1 (5%)	3 (15%)	3 (15%)	4 (20%)	2 (10%)	3 (15%)
Moderate	3 (15%)	6 (30%)	3 (15%)	7 (35%)	3 (15%)	4 (20%)	7 (35%)	4 (20%)
Poor	13 (65%)	12 (60%)	10 (50%)	5 (25%)	7 (35%)	7 (35%)	5 (25%)	6 (30%)

the initial salbutamol group in the first 2 weeks course and then it dropped (from 70 per cent to 44 per cent, which is statistically significant at 5 per cent level) as soon as the switch-over was made ; later the figure rose to 67 per cent. The initial ephedrine group's function rose to 74 per cent and then to 84 per cent on switch-over to salbutamol.

Side effects—Salbutamol was well tolerated but 1 patient refused to take the drug regularly due to side effects and was excluded. Ephedrine caused severe effects in 4 ; three were excluded.

Minor side-effects of salbutamol therapy were the following (the figures in parentheses denote the number) : Fine tremor (6), uncontrollable shaking (1), sweating and "hot flushes" (3), sleep disturbance and occasional hallucination (2), tachycardia (2), difficulty in initiation of micturition (2), rise in blood pressure (1) and nausea and vomiting (1). Little reassurance helped in the continuation of the drug.

Side effects were much more prominent in the ephedrine group. These were : Tachycardia (9), sleep disturbance and insomnia (8), general weakness and lethargy (6), rise in blood pressure (6), thumping in the chest (4), difficulty in micturition (3), restlessness (3), giddiness and vertigo (3), loss of appetite (3), tremor and shaking (2), dryness of mouth and throat (2) and hot flushes (1).

DISCUSSION

It is difficult to evaluate any therapy in a disease like bronchial asthma, whose course is unpredictable and variable. Patients having bronchial asthma have many aggravating and aetiological factors at play like infection, allergy, anxiety, etc. Treatment must be directed towards these factors. However, search has been going on for a long time for a safe and effective bronchodilator and salbutamol has raised high hopes, as evident from the studies abroad (Choo-Kang *et al., loc. cit.* ; Palmer *et al., loc. cit.* ; Warrell *et al., loc. cit.*).

With salbutamol therapy, airway obstruction is significantly reduced (Palmer *et al., loc. cit.*). There is no fall in the pulmonary vessels' oxygen saturation as the cardiac output does not rise. Being a β_2 adrenergic stimulant, it acts selectively on bronchial muscle (Palmer and Diament, *loc. cit.*). Due to technical difficulties, blood gas analysis was not done in this series.

Although as a bronchodilator, salbutamol was better than ephedrine, remarkable superiority of salbutamol over ephedrine was not evident in every case in this controlled trial. In some individual patients, however, the result was very striking. Analysis of the results showed that salbutamol always showed some advantage over the ephedrine group in the first 2 weeks and a switch-over to ephedrine nearly always showed a fall in the improvement (thus lowering salbutamol's initial effect) over the third week. It was evident, however, that 4th week's result was satisfactory in both groups. This may be due to the natural improvement and fortuitous concurrent therapy of ephedrine/salbutamol. Some of the tests in ephedrine-group in the 4th week showed results much better than initial ephedrine group and it was at times comparable to salbutamol-effect on the 4th week. Hence it is possible that ephedrine acts better in cases having preliminary treatment with salbutamol. Indirectly questioned, all but 2 cases preferred to have salbutamol to ephedrine.

The advantage of salbutamol however, was that it caused practically no adverse reaction. Shakiness, tremor, disturbed sleep, palpitation, sweating, giddiness and disturbances of micturition were noted occasionally during salbutamol therapy. There was no effect on total and differential count of WBC, Hb. per cent, blood urea and N.P.N., urine, stool, chest roentgenograms and liver function tests. No patient showed extreme intolerance to salbutamol. Sputum secretion was easier in some cases, as was observed by James (*loc. cit.*). Patients with asthma associated with chronic bronchitis derived little benefit from either salbutamol or ephedrine. Four patients showed reversal of T depression (seen in control) when ECG was repeated at the end. This phenomenon could not be explained satisfactorily.

Further trial is now in progress regarding the effect of salbutamol on cases having continuous bronchospasm and steroid therapy, and status asthmaticus.

SUMMARY

A "double-blind", "cross-over" study on 40 cases of bronchial asthma was udertnaken to compare the effects of salbutamol tablets (2 mg.) and ephedrine tablets (30 mg.) for four weeks. Salbutamol was more effective tablet for tablet than ephedrine during the study, although ephedrine sometimes gave as good a result in the fourth week. The reason for this is postulated. Salbutamol had no serious untoward effects and all but two patients preferred this to ephedrine. Salbutamol caused no change in the haematological values, liver function tests, blood urea and N.P.N. Minor reactions of salbutamol were fine tremor, sweating and hot flushes, sleep disturbance and tachycardia, which subsided gradually without any treatment. Expectoration was easier in some patients. Salbutamol is regarded as a superior substitute to ephedrine.

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5

A Study of Eosinophilia amongst Students of Aligarh

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Warton Jones in the year 1846 first described the coarse granular cells of blood and Ehrlich in 1897 named the cells as eosinophil (Archer, 1963 quoted by Barua and Saxena, 1965). Normally, the eosinophils comprise 1-4 per cent of the total leucocyte count which gives an absolute figure of 150-400 per c.mm. A count of less than 400/c.mm. has no significance. De Gruchy (1966) gave the range of absolute number of eosinophils in the blood of normal subjects from 40 to 440/c.mm. Discombe

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(1945, quoted by Britton, 1963) found that not more than 1 per cent of normal subjects have an eosinophil count exceeding 240/c.mm.

Eosinophilia occurs in variety of conditions such as allergic conditions including drug allergies, parasitic infections of intestines as well as tissue, certain skin diseases e.g., eczema, psoriasis, scabies, etc., in certain infectious and blood diseases and last in pulmonary eosinophilia. Grofton *et al.* (1952, quoted by De Gruchy, *loc .cit.*) recognised several types of pulmonary eosinophilia namely simple pulmonary eosinophilia · (Loeffler's syndrome), prolonged pulmonary eosinophilia, pulmonary eosinophilia with asthma and tropical pulmonary eosinophilia. This study has been undertaken to find out the prevalence of eosinophilia amongst the students and also various related contributory causative factors.

MATERIAL AND METHOD

The study has been conducted among students (boys and girls) of various institutions in the city of Aligarh. All those schools and colleges, where authorities were willing to cooperate in the examination and investigations of the students, were included in the study.

During the first visit to the institution, sociomedical history of each student was taken on a proforma and they were subjected to a thorough medical examination. The blood was taken by finger prick method for total leucocyte count (in Neubauer chamber) and absolute eosinophil count (by Discomb's method for enumeration of eosinophils).

Students who showed the absolute eosinophil count of 500/c.mm. and above were tuberculin tested by 1 TU of PPD (equivalent to 0·00002 mg. of purified protein derivative) and the reading was recorded after 72 hours.

After seeking the cooperation of the parents, the night blood was taken at their homes for thick and thin blood smears for detection of microfilaria. Morning stool was collected to examine for the presence of ova or cysts.

OBSERVATIONS

Total number of students examined during the study were 3013, comprising 1627 males and 1386 females.

Eosinophil count—Out of 3013 students examined, 340 showed the absolute eosinophil count of 500/c.mm. and above, showing prevalence rate of 11·3 per cent, (216 out of 1627 i.e., 13·3 per cent in male and 124 out of 1386 i.e., 8·9 per cent in female students). Among males, 180 (11·1 per cent) had a count of 500-2000/c.mm., 24 (1·5 per cent) had 2000 to 5000/c.mm. and 12 (0·7 per cent) had a count of 5000/c.mm. and above. Corresponding figures in females were, 112 (8·1 per cent), 11 (0·7 per cent) and 1 (0·1 per cent) respectively. Agewise break up of all students shows that 32 out of 203 (15·8 per cent) between 6-10 years, 199 out of 1797 (11·1 per cent) between 11-15 years and 104 out of 852 (12·3 per cent) in the age group of 16-20 years, showed absolute count of 500/c.mm. and above (Table 1). Number of such students in the age group of 21 years and above was only 5 out of 155 (3·2 per cent).

TABLE 1—SHOWING DISTRIBUTION OF STUDENTS ACCORDING TO EOSINOPHIL COUNT AND AGE

Age group (in years)	Total number examined	Absolute count below 500/c.mm.		Absolute count of 500/c.mm. and above	
		No.	%	No.	%
0—5	6	6	100·0	—	—
6—10	203	171	84·2	32	15·8
11—15	1797	1598	88·9	199	11·1
16—20	852	748	87·7	104	12·3
21—25	143	139	97·2	4	2·8
26+	12	11	91·6	1	8·4
Total	3013	2673	88·7	340	11·3

Sexwise distribution shows that among males, 24 out of 140 (17·2 per cent) in age group 6-10 years, 124 out of 884 (14·0 per cent) in 11-15 years, 65 out of 481 (13·5 per cent) in 16-20 years and 3 out of 107 (2·8 per cent) in 21-25 years, were having the count of 500/c.mm. and above (Table 2). Corresponding figures in females (Table 3) were 8 out of 63 (12·7 per cent), 75 out of 913 (8·2 per cent), 39 out of 371 (10.5 per cent) and 1 out of 36 (2·8 per cent) respectively.

Students were further classified according to their absolute count and it was observed that in males, 5 out of 24 (20·8 per cent) in age group 6-10 years, 21 out of 124 (16·9 per cent) in age group 11-15 years, and 9 out of 65 (13·9 per cent) in age group 16-20 years, were having a count of 2000/c.mm. or more (Table 2). Corresponding figures in females in the same age groups were, 1 out of 8 (12·5 per cent), 7 out of 75 (9·3 per cent) and 4 out of 39 (10·2 per cent) respectively (Table 3). 8 out of 12 males (66·3 per cent) having the count of 5000/c.mm. and above were in the age group of 11-15 years. There was only one female with a count of 5000/c.mm. and above and she was also in the age group of 11-15 years.

Religion—Table 4 shows that 192 of 1577 Muslims (12·2 per cent) and 146 out of 1410 Hindus (10·4 per cent) were having the absolute count of

TABLE 2 — SHOWING DISTRIBUTION OF MALE STUDENTS ACCORDING TO ABSOLUTE EOSINOPHIL COUNT AND AGE

Age group (in years)		Total cases	Normal cases		Cases with absolute count of 500/c.mm. and above						Total	Percentage
					500-2000		2000-5000		5000 and above			
			No.	%	No.	%	No.	%	No.	%		
0—5	...	6	6	100·0	—	—	—	—	—	—	—	—
6—10	...	140	116	82·8	19	13·6	4	2·8	1	0·7	24	17·2
11—15	...	884	760	86·0	103	11·6	13	1·5	8	0·9	124	14·0
16—20	...	481	416	86·6	56	11·6	6	1·2	3	0·6	65	13·4
21—25	...	107	104	97·2	2	1·9	1	0·9	—	—	3	2·8
26+	...	9	9	100·0	—	—	—	—	—	—	—	—
Total	...	1627	1411	86·1	180	11·1	24	1·5	12	0·7	216	13·3

TABLE 3—SHOWING DISTRIBUTION OF FEMALE STUDENTS ACCORDING TO ABSOLUTE EOSINOPHIL COUNT AND AGE

Age group (in years)		Total cases	Normal cases		Cases with absolute count of 500/c.mm. and above						Total	Percentage
					500-2000		2000-5000		5000 and above			
			No.	%	No.	%	No.	%	No.	%		
0—5	...	—	—	—	—	—	—	—	—	—	—	—
6—10	...	63	55	87·3	7	11·1	1	1·5	—	—	8	12·7
11—15	..	913	838	91·8	68	7·4	6	0·7	1	0·1	75	8·2
16—20	.	371	332	89·5	35	9·4	4	1·1	—	—	39	10·5
21—25	...	36	35	97·2	1	2·7	—	—	—	—	1	2·8
26+	...	3	2	66·6	1	33·4	—	—	—	—	1	33·4
Total	..	1386	1262	91·1	112	8·1	11	0·7	1	0·1	124	8·9

500/c.mm. and above. Their sexwise distribution was 12·1 per cent males and 12·7 per cent females in Muslims and 18·6 per cent males and 7·9 per cent females in Hindus.

Break up of students with the high count shows that 23 out of 154 (14·9 per cent) in Muslim males and 13 out of 62 (20·9 per cent) in Hindu males had a count of 2000/c.mm. and above. In females this number was 7 out of 38 (12·4 per cent) in Muslims and 5 out of 84 (5·9 per cent) in Hindus.

Social classification of cases—According to the social classification given by Prasad (1961) it was observed that nearly half of the total sample (46·6 per cent) was from the social class III and IV i.e., lower middle and poor income group (per capita income ranging from rupees 15 to 49 per month). 68 out of 492 (13·8 per cent) in class V (very poor), 91 out of 636 (14·3 per cent) in class IV and 86 out of 767 (11·2 per cent) in class III had a count of 500/c.mm. and above. Percentage of such students was only 9·6 and 7·5 in social classes I and II (rich and upper middle group) respectively.

Geographical distribution of persons—Majority of students i.e., 2771 out of 3013 (91·9 per cent) were from Western U.P. followed by 64 (2·1 per cent) from Eastern U.P. Number of students showing a high absolute count was 329 out of 2771 (11·9 per cent) students drawn from Western U.P. and 7 out of 64 (10·9 per cent) from Eastern U.P.

Eosinophilia and Mantoux test—The number showing positive tuberculin reaction was 52 out of 199 (26·1 per cent) students with a count of 500-2000/c.mm., 20 out of 32 (62·5 per cent) with a count of 2000-5000/c.mm. and 5 out of 13 (38·5 per cent) students with a count of 5000/c.mm. or more. The number of those with a count of 2000/c.mm. and above was 25 out of 77 (35·1 per cent) in tuberculin positive and 20 out of 167 (11·9 per cent) in tuberculin negative students.

Night blood film and eosinophilia—Only 239 out of 340 cooperated for thick and thin smear examination of night blood film and not a single positive case of microfilaria was detected.

TABLE 4—SHOWING DISTRIBUTION OF STUDENTS ACCORDING TO RELIGION AND SEX

Religion and sex	No. of cases	Normal cases		Cases with absolute count of 500/c.mm. and above						Total	Percentage
				500-2000		2000-5000		5000 and above			
		No.	%	No.	%	No.	%	No.	%		
Muslims ...	1577									192	12·2
Male ...	1277	1123	87·9	131	10·3	14	1·1	9	0·7	154	12·1
Female ...	300	262	87·3	31	10·3	7	2·4	—	—	38	12·7
Hindus ...	1410									146	10·4
Male ...	335	273	81·4	49	14·7	10	2·9	3	1·0	62	18·6
Female ...	1075	991	92·1	79	7·4	4	0·4	1	0·1	84	7·9
Others ...											
Male ...	51	15	100·0	—	—	—	—	—	—	—	—
Female ...	11	9	81·8	2	100·0	—	—	—	—	2	18·2
Total ...	3013	2673	88·7	292	9·6	35	1·3	13	0·4	340	11·3

Stool examination and eosinophilia—Stool of 237 (103 did not cooperate) students with a count of 500/c.mm. and above was examined for any ova or cyst and 30 of them (12·6 per cent) were found positive, maximum being the ova of *Ankylostoma duodenale* in 11 persons and *Ascaris lumbricoides* in 5. Number of positive cases were 22 out of 190 (11·6 per cent) showing the count of 500-2000/c.mm., 8 out of 34 (23·5 per cent) showing, 2000-5000/c.mm. and there was no positive case among those showing count of 5000/c.mm. and above (Table 5).

TABLE 5—SHOWING DISTRIBUTION OF STUDENTS WITH HIGH ABSOLUTE COUNT AND STOOL EXAMINATION

Stool examination	Absolute eosinophil count above 500/c.mm.				
	500-2000	2000-5000	5000 and above	Total	Percentage
Ova of *Ankylostoma duodenale* ...	6	5	—	11	36·6
Ova of *H. nana* and *Ankylostoma duodenale*	2	—	—	2	6·7
Ova of *Ascaris lumbricoides* and *Taenia solium* ..	1	—		1	3·3
Ova of *Ascaris lumbricoides*	4	1	—	5	16·7
Ova of *Enterobius vermicularis* ...	3	—	—	3	10·0
Ova of *Hymenolepis nana*	2	—	—	2	6·7
Cyst of *Ent. histolytica* ...	—	1	—	1	3·3
Cyst of *Ent. coli* ...	3	1	—	4	13·4
Trichomonas (active motile)	1	—	—	1	3·3
Total positives ...	22	8	—	30	100·0
Total number of students	190	34	13	*237	
Percentage of positive cases	11·6	23·5	0	12·6	

* 103 students did not get their stool examined.

History of past illness—Altogether 80 out of 340 students (23·5 per cent) gave history of some illness in the past (2 persons gave more than one). The most common illnesses (Table 6) were passing of worms in stool in 51 (62·3 per cent), fever in 8 (9·7 per cent), eczema in 5 (6·1 per cent) and swelling of veins and glands in 3 (3·6 per cent). Only 15 out of 48 students (31·2 per cent) showing the count of 2000/c.mm. and above gave the history of any past illness (passing of worms in stool in 9, eosinophilia in 2, fever in 1, pulmonary complications in 1, glandular swelling in 1 and asthma in 1).

TABLE 6—SHOWING DISTRIBUTION OF 80 STUDENTS GIVING PAST HISTORY ACCORDING TO HIGH ABSOLUTE COUNT

Past history of illness	Absolute eosinophil count per c.mm.				
	500-2000	2000-5000	5000 and above	Total	Percentage
Pulmonary infection ...	1	1	—	2	2·4
Passage of worms in stool	42	5	4	51	62·3
Fever ...	7	1	—	8	9·7
Swelling glands ...	1	1	—	2	2·4
Tender swelling vein ...	1	—	—	1	1·2
Eosinophilia ...	1	2	—	3	3·6
Asthma ...	—	1	—	1	1·2
Urticaria ...	4	—	—	4	5·0
Eczema ...	5	—	—	5	6·1
Any other ...	5	—	—	5	6·1
Total ...	67	11	4	82	

* Two cases gave history of two illnesses.

TABLE 7—SHOWING DISTRIBUTION OF STUDENTS ACCORDING TO PRESENT COMPLAINTS AND HIGH ABSOLUTE COUNT

Present complaints	Cases with absolute count of 500/c.mm. and above			Total		Percentage	
	500-2000	2000-5000	5000 and above				
Occasional cough	64	9	3	76	102	13·5	18·2
Continuous cough	4	1	1	6		1·1	
Dry cough ...	12	2	—	14		2·5	
Troublesome cough ...	5	1	—	6		1·1	
Mild expectoration ...	28	2	2	32		5·7	
Moderate expectoration ...	20	4	—	24		4·3	
Huge expectoration ...	7	—	—	7		1·2	
Breathlessness on severe exertion	45	5	3	53		9·4	
Breathlessness on mild exertion ...	19	2	3	24		4·3	
Haemoptysis (occasional)	6	—	—	6		1·1	
Low grade fever	32	5	1	38		6·8	
High grade fever	10	3	1	14		2·5	
Occasional fever	35	2	2	39		6·9	
Weakness ...	50	12	5	67		11·9	
Pain in chest ...	12	2	—	14		2·5	
Headache ...	74	14	6	94		16·7	
Gastro-intestinal	36	2	3	41		7·3	
Scrotal swelling ..	3	1	—	4		9·7	
Swelling of any part ...	3	—	—	3		0·5	
Total ...	465	67	30	562		100·00	
Total number of cases in the group ...	292	35	13	340			
Average number of complaints per person ...	1·6	1·9	2·3	1·6			

Present history—(Complaints present during the time of survey). Out of 340 persons showing eosinophil count of 500/c.mm. and above, 235 (69·1 per cent) gave various complaints (Table 7). Total number of complaints were 562, as most of the persons gave more than one complaint. Average number of complaints per person was 1·6 with a count of 500-2000/c.mm., 1·9 with a count of 2000-5000/c.mm. and 2·3 with a count of 5000/c.mm. and above. Major complaints were cough (102 persons i.e., 18·2 per cent) gastro-intestinal disturbances (41 persons i.e., 7·3 per cent).

As regards the severity of symptoms it was observed that 164 out of 340 cases (48·2 per cent) were asymptomatic, 134 (39·4 per cent) had mild symptoms, 38 (11·2 per cent) had moderate symptoms and 4 (91·2 per cent) had severe symptoms (Table 8).

Symptomatic cases were 146 out of 292 (50·0 per cent) showing count of 500-2000/c.mm., 19 out of 35 (54·3 per cent) showing count of 2000-5000/c.mm. and 11 out of 13 (84·6 per cent) showing count of 5000/c.mm. and above.

30 out of 48 (62·5 per cent) having the count of 2000/c.mm. and above showed mild to severe symptoms (16 were of pulmonary origin, 3 of fever, 4 of gastro-intestinal disturbances and 7 of miscellaneous symptoms e.g., headache and weakness etc.).

DISCUSSION

Out of 3013 students examined, 340 (11·3 per cent) showed absolute eosinophil count of 500/c.mm. and above. The percentage was higher in boys (13·3) than in girls (8·9) and it was found to be statistically significant (P=4·1). Similar difference was also observed in students with a count of 2000/c.mm. and above (16·6 per cent in boys and 9·6 per cent in girls). It may be due to the fact that males have more out door life than females and hence are more exposed to infection and allergens. Dietary variations may also be a contributing factor, as majority of males were Muslims.

Students in the age group of 6-10 years showed the maximum prevalence rate of eosinophilia (24

TABLE 8—SHOWING DISTRIBUTION OF STUDENTS ACCORDING TO HIGH EOSINOPHIL COUNT AND SEVERITY OF SYMPTOMS

Symptoms	Absolute eosinophil count						Total	Percentage
	500-2000/c.mm.		2000-5000/c.mm.		5000/c.mm. and above			
	No.	%	No.	%	No.	%		
Asymptomatic . .	146	50·0	16	45·6	2	15·4	164	48·2
Mild symptoms ...	116	39·5	15	42·9	3	23·1	134	39·4
Moderate symptoms ...	28	9·7	3	8·6	7	53·8	38	11·2
Severe symptoms .	2	0·8	1	2·9	1	7·7	4	1·2
Total ..	292	100·0	35	100·0	13	100·0	340	100·0

out of 140 i.e., 17·2 per cent in males and 8 out of 63 i.e., 12·7 per cent in females). Further analysis revealed that comparatively more students in the age group 6-10 years showed an absolute count of 2000/c.mm. and above (5 out of 24 i.e., 20·8 per cent in males and 1 out of 8 i.e., 12·5 per cent in females). But the differences of prevalence in various age groups were not statistically significant in both male and female students.

The percentage of eosinophilia was highest in Hindu males and lowest in Hindu females. However the incidence in Hindu males (18·6 per cent) was found to be higher and statistically significant (P=2·8) than that of Muslim males (12·1 per cent). No statistically significant difference could be found in prevalence among Muslim females (12·7 per cent) as compared to Hindu females (7·9 per cent).

High prevalence was also observed in lower social classes, probably being more exposed to various infections and allergens due to unsatisfactory environmental conditions.

Majority of students were from Western U.P. but the percentage with a count of 2000/c.mm. and above was more in persons from Eastern U.P. No statistical significant difference could be obtained as far as the prevalence in East and West of U.P. is concerned.

No direct correlation between tuberculin sensitivity and high eosinophil count could be observed.

Microfilaria could not be detected in night blood film examination in any student. This observation is more significant in students having absolute count of 2000/c.mm. and above (tropical pulmonary eosinophilia) in which one of the causative factors is infestation with microfilaria.

Filarial origin of TPE has been supported by the demonstration of constantly high titre of filarial compliment fixing antibodies in the serum (Danaraj 1957 and 1959 quoted by Nath *et al.*, 1963) and a constant clinical, haematological and serological response to therapy with diethyl carbamazine (Danaraj, 1958 ; Ganatra *et al.*, 1958 : Baker *et al.*, 1959). However none of these tests have been carried out in this study.

Gault and Webb (1957) and Webb *et al.* (1960) also suggested the filarial origin of TPE by demonstrating the parts of nematode larvae in the liver and microfilaria in liver, lung and lymph glands respectively. They have suggested that the infective larvae introduced by mosquito bites have developed somewhere in the body into sexually mature adult filaria capable of producing microfilaria without completing the life cycle, the man being the intermediate host. Demonstration of microfilaria in peripheral blood is a rare feature in cases of TPE. Webb *et al.* (*loc. cit.*) have postulated that the microfilaria after release into blood stream are trapped in the first set of capillaries through which they pass to lung. Manson Bahr (1959) has also reported that no microfilaria has been demonstrated in the blood in cases of T.P.E. No effort have been made in this study to demonstrate filarial organism either in peripheral blood or in liver biopsy study.

Stool was found positive for ova or cysts in 12·6 per cent. Though the positivity rate was highest in the group showing an absolute count of 2000/c.mm. to 5000/c.mm. (23·5 per cent) there was not a single positive case amongst students who had a count of 5000/c.mm. and above. It is, therefore, assumed that in cases of parasitic intestinal infestations the rise of eosinophils may not be very high and mostly ranges from 500/c.mm. to 5000/c.mm.

Importance of past history in cases of eosinophilia is well known as 80 out of 340 (23·5 per cent) having a count of 500/c.mm. and above gave history of some past illness, the most common being, history of intestinal worms by 51 (62·3 per cent), allergic manifestation like asthma, urticaria and eczema by 10 (12·3 per cent) and any history suggestive of filarial infection (fever or any swelling on the body) by 11 (13·3 per cent).

There were 48 students in all with an absolute count of 2000/c.mm. and above. 30 out of them were having symptoms while 18 were symptomless. Symptoms suggestive of tropical pulmonary eosinophilia were present in 16 (50·2 per cent) and stool in 5 of them was found positive for intestinal worms. There was also one student of suspected filariasis with swelling of scrotum and occasional fever, but no microfilaria was detected in night blood film examination. Out of remaining 14 students with symptoms, 4 were having gastro-intestinal disturbance, 3 of pyrexia of varying intensity and 7 complained of headache, weakness and occasional cough, etc., but no positive finding in these students could be found during clinical and pathological examination. Therefore, it is presumed that these students were having aberrant clinical manifestation of tropical pulmonary eosinophilia or of parasitic infestation. No radiological examination was done in the present series which might have brought out the incidence of tropical pulmonary eosinophilia (TPE) more precisely.

As regards remaining 18 students who were having an absolute count of 2000/c.mm. and above and 116 students with the moderate high count of 500-2000/c.mm. but with very slight symptomatology, it can only be suggested that they are also cases of parasitic infestation in which it was not possible to demonstrate the presence of ova or cyst in the stool and needed further follow-up.

SUMMARY

The study has been conducted to find out the prevalence of eosinophilia amongst the students of Aligarh city. 340 out of 3013 students, showed the absolute eosinophil count of 500/c.mm. or more, showing a prevalence rate of 11·3 per cent (13·3 per cent in males and 8·9 per cent in females). Statistically significant difference was observed in the prevalence rate among boys and girls. Students in the age group of 6 to 10 years showed a maximum prevalence. Percentage of eosinophilia was highest in Hindu males and lowest in Hindu females. Students drawn from lower social classes showed higher prevalence. No direct correlation between tuberculin sensitivity and high eosinophil count was observed and microfilaria could not be detected in the blood smear of any student. Stool was found positive for ova or cysts in 12·6 per cent of students showing eosinophilia and was highest in the group showing a count of 2000/c.mm. to 5000/c.mm. No ova or cyst was found in the stools of those showing a count of 5000/c.mm. or more. Only 80 students (23·5 per cent) with eosinophilia gave history of some past illness. The most common was, history of intestinal worms in 51 (62·3 per cent), allergic manifestations like asthma, urticaria and eczema etc., in 10 (12·3 per cent) and history suggestive of filarial infection such as fever, swollen glands and vein in 11 (13·3 per cent). The symptom, ranging from mild to moderate, were present in 176 (51·8 per cent) and 164 (48·2 per cent) were asymptomatic. Only 30 out of 48 students (62·5 per cent) showing a count of 2000/c.mm. and above showed symptoms. Symptoms suggestive of tropical pulmonary eosinophilia, were present in 16 (50·2 per cent) of them. As regards the rest of the 18 students and the students with moderate high count i.e., 500-2000/c.mm. with very slight symptomatology, it has been suggested that they may be cases of aberrant parasitic infection where it was not possible to demonstrate any ova or cyst in stool and needs follow-up.

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PRACTITIONERS' SERIES

I

Leprosy—Its Diagnosis†

K. RAMANUJAM*

Leprosy, a disease characterised by low infectivity and toxicity, insidious onset and prolonged duration and long incubation period (preferably called 'latent period') is widely prevalent in India. The general practitioner, in whichever part of the country he is practising, is bound to come across cases of leprosy, the frequency of such cases depending upon the endemicity of the disease in that area. Early diagnosis and treatment of cases ensure quick and complete recovery from the disease, and of thereby escaping the incapacitating deformities and psychic trauma. As such it is imperative that every medical man in this country should be able to recognise a case of leprosy and institute appropriate treatment forthwith.

Whenever an individual reports a 'patch' on the skin or neuritic symptoms, it will be a wise and safe policy first to exclude leprosy as being the cause, irrespective of the social status of the individual.

PRESENTING SYMPTOMS :

Leprosy generally presents itself in one of the following ways, in that order of frequency:

(i) A 'patch' on the skin, usually hypopigmented, sometimes erythematous, or coppery in colour which has persisted for a long period of time (months or years), growing insidiously without causing much of a subjective symptom except perhaps numbness or anidrosis or progressive depilation.

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† Lecture delivered at the Refresher Course in Leprosy held at Chinglepput on 25-3-1972

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(ii) An area of numbness in the skin, usually over the extremities, discovered accidentally while scratching the skin or bathing.

(iii) Slowly developing disability or deformity, usually in the hands, noticed while buttoning up garments, cupping the hand or handling small objects.

(iv) Thickening and shininess of the skin, especially over the face.

(v) occurrence of painless ulcers or blisters over the feet or hands.

CASE TAKING :

After obtaining the name, age and sex of the individual, the case taking should include enquiry about his nativity (to know whether he is from an endemic area), occupation, history of leprosy in the family, history of contact with cases of leprosy, the presenting symptom and the treatment, if any. Special attention should be paid to the elicitation of the presenting symptom, because in very many instances this may offer suggestive evidence of leprosy.

METHOD OF CLINICAL EXAMINATION :

The clinical examination of an individual suspected to be suffering from leprosy should be absolutely thorough, looking over the patient from head to foot. The subject should be examined in good, natural light with the clothes stripped off to the extent permissible, the light falling on the patient from behind the examiner, in order to facilitate the recognition of the vague early and more serious skin manifestations of leprosy which will otherwise be missed if the examination is done in a porly lighted room. It is a wrong practice to examine just the part presented by the patient and offer an opinion. Because, very often the patient either unconsciously or wilfully does not show the patch which made him suspect leprosy but points out to an imaginary one. If this practice of complete examination of the body surface is not adhered to, cases are likely to be missed.

The actual clinical examination is done on the same principles followed in the medical proctice as indicated below:

(i) Inspection of the body surface for the presence of patches, areas of shininess, diffuse infiltration, nodules or presence of deformity peculiar to leprosy. In leprosy, the word 'patch' is used to indicate an area of altered colouration or texture in the skin. The sites of predilection for the occurrence of patches are the cheeks, outer aspect of the extremities, back and buttocks.

(ii) Palpation of the peripheral nerve trunks at the sites where they are superficially located and their cutaneous branches in order to detect any thickening or tenderness in these nerves. It should be remembered that the peripheral nerve trunks are palpable and that a palpable nerve is not necessarily a thickened nerve.

(iii) Detailed examination of the patches when present, should be carried out with reference to their morphological appearance and sensory changes. Lastly, where possible, smears should be taken from the periphery of the patches.

Since the diagnosis of leprosy in a large percentage of cases is dependent upon the elicitation of sensory changes in the patch, the procedure for the testing of sensation in the skin is now described in a little more detail. Tht object of this procedure is to find out whether in the affected part there is any change in the appreciation of the normal skin sensations viz., fine touch, pain and temperature. To elicit these, the equipment needed are—a fine feather or a wisp of cotton wool, a sharp pin and two test tubes one containing hot water (about 110°F) and another cold water, respectively. Before commencing the test it must be explained to the patient the manner in which the tests are to be performed on him, and how he has to respond.

The testing for skin sensation should be sharp and short. Stroking with the feather should be light and strictly localised, and dipping the needle into the skin sharp, each to be done only once each time, in order to avoid summation of stimuli. To start with, the testing should be done first in the normal skin and then in the affected part and should be completed quickly, in order not to tire the patient. If the patch occurs in a hairy portion of the skin the sensation of fine touch should be tested after shaving off the hair.

Child patients are difficult to deal with. They often do not respond to tactile tests because they are either frightened or too young to respond to the tests. However, one test that will prove very useful with this class of subjects is the elicitation of pain sensation. If the pain sensation is appreciated at the site of testing, the child quickly withdraws the site tested or rubs the skin over the pricked area: and if the testing is over the buttock, the underlying gluteal muscle will be observed to contract.

ROUTINE DIAGNOSTIC METHODS:

It has been said that to diagnose leprosy the essential prerequisites are a pair of observant eyes, and an unbiased mind. The diagnosis of leprosy is made in the vast majority of instances mostly on clinical grounds. Sometimes, it will be necessary to seek the help of the laboratory. However, it is considered highly desirable that the clinical examination be always supplemented with a bacteriological examination.

The diagnosis of leprosy will be tenable only on the elicitation of one or other of the cardinal features of leprosy, which briefly enunciated are as under:

(i) Clinical signs of peripheral nerve involvement, and (ii) demonstration of *Myco. leprae* in the smears taken from the skin and/or nasal mucosa by standard methods of examination.

The first cardinal sign manifests as:

(a) Thickening of the peripheral nerve trunks—the ulnar above the bend of the elbow, the lateral popliteal in the lateral part of the popliteal fossa, the great auricular nerve over the side of the neck, the posterior tibial nerve behind and below the medial malleolus and the median nerve at the wrist, etc., in that order of frequency. This thickening of the nerve may be relative or absolute. Thickening of the cutaneous branches may also be present.

(b) Tenderness over the nerve on palpation.

(c) Interference with sensory and/or motor functions of the affected nerve over the area subserved by the nerve, producing loss or impairment of any of the three normal sensation in the skin, viz., appreciation of pain, temperature and fine touch in that order; or diminution or loss of power in the voluntary muscles causing wasting of muscles and deformity.

All patches of leprosy will not necessarily show sensory changes. While these are not usually demonstrable in patches of lepromatous leprosy, they constitute the presenting feature in non-lepromatous, and intermediate patches. It is important to remember that even in the latter, some patches may show total loss of one or more of the skin sensations, while others may show just an impairment; that the patches on the extremities often show more sensory changes while those on the face may not show any; and that the central part of the patch shows more sensory changes than the periphery.

The second cardinal sign envisages the demonstration of the causative organism of leprosy in the smears prepared by the 'slit and scrape' method from the skin patches, or scraping from the nasal mucosa. The skin smears are always positive for lepra bacilli in all cases of active lepromatous leprosy and in the vast majority of intermediate cases. In non-lepromatous cases it is generally negative. The demonstration of the second cardinal sign is sometimes necessary either to confirm the diagnosis of leprosy or the classification of a definite case.

It is wise to remember that when in doubt any opinion should be held in reserve and the re-examination carried out suitably.

SPECIAL DIAGNOSTIC METHODS:

Occasionally one encounters cases in whom clinical signs are equivocal and the results of bacteriological examination are negative. Such instances generally arise in children. In these cases, one of the two special methods of examination may help in the diagnosis:

(i) Demonstration of *Myco. leprae* by the concentration method in a piece of tissue removed from the suspicious area, and

(ii) Examination of a piece of skin biopsied from the suspected area histopathologically for evidences characteristic of leprosy.

It is obvious that the above methods of examination will be available only in special institutions. When these facilities are not available, the best practice will be to keep the individual under observation until either one or other of the cardinal signs are demonstrable or the suspicious patch disappears.

OTHER DIAGNOSTIC METHODS:

The other tests that may be useful in the diagnosis are:

(i) the pilocarpine test for testing anidrosis in the patch and (ii) the histamine test for the elicitation of 'flare' in the suspected area.

SUMMARY

(1) The need for excluding leprosy as the cause in individuals reporting with a patch or neuritic symptoms, and the need for the recognition of early cases of leprosy is stressed.

(2) The methods of case taking and clinical examination of cases are described; mention is made of the difficulties of examining child cases and their management.

(3) The routine diagnostic methods employed are described. In addition, mention is made of the special and other diagnostic procedures.

2

Treatment of Leprosy[†]

K. RAMANUJAM[*]

THE DRUG

The treatment of leprosy has been revolutionised by the rediscovery and introduction of sulphone two decades ago. This drug, though not the last word in the treatment of the disease, is by about the best we have at present.

Di-aminodiphenylsulphone (DDS, Dapsone I.P.), 'sulphone', for short, is considered the ideal anti-leprosy drug for the reasons that (i) it is easily available, (ii) it is easily administrable (oral), (iii) it is non-toxic if taken in the doses advised, (iv) it is effective in a reasonable period of time and (v) it is cheap. By the oral route it is almost completely absorbed, eliminated mainly in the urine but a part tends to be retained in certain tissues in the body.

ADMINISTRATION

The drug can be given orally or parenterally. Both have got their own advantages and disadvantages. Oral route is preferred because of its easy and wider applicability.

Frequency of administration—The drug when given orally can be given every day, twice a week or even once a week. Although under field conditions and in the rural setting of the disease, twice a week treatment is recommended, daily regimen is preferable and perhaps more convincing to the patient.

Dose—The maximum dose of the drug recommended is 10 mg of DDS per kg. body weight per week. But in practice and under field conditions, the maximum dose of the drug to the various age groups has been arbitrally fixed as : (i) Adults—600 mg. per week and (ii) children—up to 4 years—100 mg. per week, 5-9 years—200 mg. per week and 10-14 years—300 mg. per week. Experience has shown that doses much smaller than the standard dose are equally effective. But it will be a wise policy not to indulge in very small doses especially in lepromatous cases, unless compelled by circumstances.

Induction—The essence of sulphone therapy lies in its slow induction—start with a small dose, increase by small doses at stated intervals, reaching the maximum dose in about four to six months. This is done with a view to avoid the onset of undesirable and serious complications which have been known to occur when the treatment is initiated otherwise.

In the 'twice a week' regimen (i) for the adults, the initial dose is 25 mg. of DDS twice a week, increased by 25 mg. every two weeks till a dose of 150 mg. twice a week is reached. Thereafter, the stepping up of the dose of DDS can be done by 50 mg. every two weeks, the patients reaching the maximum dose from the fifth month onwards. (ii) For children—the initial dose is 10 mg. twice a week in the 10-14 years age group, 5 mg. twice a week in the 5-9 years age group and 2½ mg. twice a week in 0-4 years age group. The stepping up here is also done gradually as in the case of adults.

In lepromatous and borderline cases, the working up of the dose must be done with great caution. If during the course of the stepping of DDS dose, patient exhibits any sign of intolerance, the dose given on the last occasion or even less than that has to be administered and stepping up thereafter done with more caution. It is most essential to remember that irregular and injudicious treatment will sometimes lead to irreversible complications of the disease and thereafter it may be almost impossible to retrieve the situation.

DURATION :

The treatment should continue in therapeutic doses, in the first instance, till all activity of the disease subsides as evidenced by (i) the absence of increase in extent and number of patches, (ii) subsidence of infiltration and erythema in the patches, (iii) absence of tenderness in the peripheral nerves and (iv) bacteriological negativity in the skin and nasal mucosa. Once this has been achieved, further treatment will depend upon the type of the case under treatment. WHO Expert Committee on leprosy (1970) recommends continuation of treatment in therapeutic doses for 1½ years, 5 years and 10 years after the disease had subsided and remained subsided in non-lepromatous indeterminate, and borderline and lepromatous cases respectively. Thereafter, the treatment can be stopped and the patients advised to report for a periodical check up once in 6 months. However, it is considered safer for the patient belonging to the borderline and lepromatous type to continue after subsidence, on a maintenance dose (which is half the therapeutic dose).

Interruption of treatment—Evidence of intolerance to the specific treatment manifesting as certain complications peculiar to the disease will call for a modification of the dose or even temporary cessation of the specific therapy, this depending upon the nature and severity of the complicating condition. Re-introduction or restoration of specific treatment should be effected with caution once the complicating condition had been brought under control.

[†] Lecture delivered at the Refresher Course in Leprosy held at Chingleput on 25-3-1972

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RESULTS

In a very high proportion of cases sulphone therapy confers considerable benefit on the patient. Clinical improvement occurs in all types of the disease, this being more appreciable in the lepromatous subjects.

In the non-lepromatous cases improvement manifests as (i) the subsidence of erythema and thickening in the infiltrated tuberculoid lesions and (ii) partial return of sensation in the skin patches and peripheral parts of the extremities. The return of colour to the hypopigmented areas is very slow, and this causes much disappointment to the patient.

In lepromatous cases, the clinical improvement is more striking—especially in the advanced florid lepromatous patients. There is a gradual shedding off of the erythema, progressive flattening of the plaques and the nodules in the skin, clearing up of the nasal obstruction, healing of nasal ulcers and disappearance of laryngeal symptoms, if present. The asymptomatic, insidious, progressive endogenous ocular lesions are also said to benefit to some extent. The bacteriological clearance, however, is never commensurate with clinical subsidence.

The deformities and disabilities already sustained by the patient are in no way influenced by sulphone therapy.

Contraindication—These would be the presence of anaemia (a haemoglobin level of less than 8g. per cent, debilitating condition and presence of complication of leprosy such as reaction, neuritis, etc.

Complications—In order of their frequency of occurrence, they are: (i) Anaemia of the regenerative type, (ii) onset of reactive states, neuritis, etc., (iii) sulphone intoxication, (iv) psychosis, and (v) hepatitis. Very exceptionally sulphone dermatitis and areas of hyperpigmentation may occur.

Sulphone resistance—The occurrence of a few authentic sulphone resistant lepromatous cases have been reported. Generally, this is the outcome of inadequate and irregular sulphone therapy and a grave danger that looms large in the present time where there is an increasing tendency to use smaller doses of DDS in lepromatous cases. The lack of clinical response in a reasonable period of time, clinical deterioration following initial improvement and an upward trend in the M.I. (morphological index) in the wake of an initial fall are all indications of possible emergence of sulphone resistant strains of *Myco. leprae*. The safest policy to pursue in order to avoid this calamity is to administer DDS in adequate doses (not less than 400 mg./week) to all active cases of lepromatous leprosy.

OTHER DRUGS

For patients who have the misfortune to become intolerant to DDS, the three drugs available in this country and worthy of trial are: (i) Thiacetazone (thiosemicarbazone), (ii) aqueous sulphetrone (50 per cent)—solasulfonum (I.P.) and (iii) clofazimine.

Thiacetazone, administered orally, in gradually increasing doses up to a maximum of 150 to 200 mg./day is a useful second-line drug. This drug is known to produce leucopenia and would hence necessitate periodical white cell counts.

Aqueous sulphetrone administered intramuscularly in a maximum dose of 2 to 4 ml. twice a week, has the advantage of being administrable to cases who are anaemic or in poor general health. When used in fractional doses, it is known to breakdown the sensitivity to DDS and enable the patitnt to accept DDS. However, the drug has its own limitation.

Clofazimine has hit the headline in recent times as a versatile drug with certain special attributes. Apart from its being anti-mycobacterial, by nature of its anti-inflammatory action it possesses anti-reaction properties (which according to some workers compares favourably with those of corticosteroids without their undesirable side effect) and also therapeutically effective in sulphone-resistant cases. This is a drug with a great promise. The special virtues of the drug are however offset to some extent by certain disadvantages: (i) Its high cost, (ii) the tendency for the skin to get pigmented leading to its aesthetic unacceptability and (iii) development of generalised dryness and scaliness of skin.

SUMMARY

(1) Di-aminodiphenylsulphone—Dapsone (IP) is the best drug that is available for the treatment of leprosy.

(2) A slow induction, regular and continued administration in adequate doses till the subsidence of activity of the disease and its continuance thereafter for varying periods in therapeutic doses depending upon the type of the disease are the essence of therapy of the disease.

(3) The occurrence of complications of the disease, while on specific therapy, will necessitate a modification of the dose or its temporary cessation, this depending upon the severity of the complicating conditions.

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3

Management of Reactions in Leprosy†

G. RAMU*

"Reactions" or "Reactive states" in leprosy are episodic exacerbations of skin and mucous membrane lesions, occurrence of fresh lesions and aggravation of pre-existing lesions in nerves or other sites. These reactions are associated with lepromatous, tuberculoid and borderline leprosy.

While the pathogenesis of reactions are still under investigation they are known to be provoked by certain factors, such as (1) concomitant infections e.g., malaria, filaria, septic infections, exanthemata, etc. (2) physical, physiological or psychological stress, (3) smallpox vaccination, TAB vaccination, tuberculin testing, (4) excess of "hot food" or "alcohol", (5) drugs—e.g., injudicious antileprosy therapy and some commonly used drugs, e.g., sulphonamides, potassium iodide, diethylcarbamazine citrate (hetrazan), etc. A single factor or drug has not been known to be the cause of reaction in all cases or repeated attacks in the same individual.

The clinical characteristics of the three types of manifestations are summarised in Table 1.

MANAGEMENT

In the mild forms simple analgesic and anti-inflammatory drugs like aspirin or salicylates, might be all that may be necessary.

Reactions of moderate intensity (a temperature of 100°F) and/or inflammatory skin lesions of both extremities call for bed rest, asperients and a fluid diet. The dose of dapsone may be halved, and besides analgesics and tranquillisers an anti-reaction drug has to be used. Antimalarials like chloroquine and amodiaquine hydrochloride (camoquin) have been used for the suppression of lepra reaction. However, amodiaquine hydrochloride in large doses have toxic effects like nausea, vomiting, anorexia, hyperpigmentation, asthenia, tremors and rarely parkinsonism.

Chloroquine sulphate or diphosphate is given in a dose of 1 tablet (200 mg. with 150 mg. of the base) 3 times a day till the fever settles down and 1 tablet twice a day for 2 weeks till the inflammatory lesions subside. It is comparatively easy to administer, free from serious side effects, and has anti-inflammatory properties (Ramanujam *et al.*, 1964).

In the severe forms (temperature rising over 102°F) and skin lesions covering extensive areas with pustulation and or ulceration, hospitalisation is necessary. Management consists of (1) complete rest in bed, (2) careful nursing and (3) suspension of antileprosy treatment, (4) reassurance, (5) use of tranquillisers and analgesics. For painful arthritis non-steroid anti-inflammatory drugs like phenylbutazone or oxyphenbutazone are given in doses of 100 mg. twice or thrice a day. Antimonials still remain the basic therapy in the treatment of severe reaction (Dharmendra and Cochrane, 1952). Potassium antimony tartarate (PAT) is administered in a dose of 0·02 g. for the first 3 injections and in 0·04 g. dose for the next three intravenously in the form of a freshly prepared 2 per cent solution in 10 ml. of normal saline or along with calcium gluconate 10 per cent 10 c.c. Care should be taken not to inject any solution into the tissue as severe pain and inflammation and sometimes necrosis may result. In a severe case where the reaction is not controlled, the number of injections may be increased. Long continued use of PAT is toxic to the liver and heart. In the absence of a response to this treatment within a reasonable period the patient is transferred to corticosteroid therapy. PAT is contra-indicated in the presence of pre-existing liver disease, pulmonary tuberculosis, severe anaemia and kidney damage.

Under situations where PAT cannot be administered e.g., lack of fresh solution, in children and in the field the trivalent compound (fantorin) may be used in a dose of 2 c.c. parenterally of a 6 per cent solution by the intramuscular route on alternate days for 6 to 10 injections. A pentavalent compound of antimony (stibatin) given parenterally in a dose of 3-6 c.c. (100 mg./c.c.) for 10 injections may be given instead.

CORTICOSTEROID THERAPY:

Corticosteroids have a partial or complete suppressive effect in all but do not alter the natural course of leprosy. Recourse to corticosteroid therapy is taken only when the regimen with the routine measures have failed, life is imperilled, paralysis is threatened or in iridiocyclitis with impending loss of vision. Corresponding dosage of prednisone or prednisolone, triamcinolone or betamethasone is given once a day. An initial 20 mg. of prednisolone or the corresponding dose of any of the analogues is given once daily. If no response is obtained the dose may be increased by 10 mg. given as another dose. If and when a favourable effect is apparent the dose is tailed off gradually, the dose being lowered by ½ tablet once every 4th to 6th day and continued even after there is amelioration for about a week. In practice, however, it is found that taking a patient off steroids poses a problem of considerable difficulty

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TABLE 1—SHOWING THE CLINICAL CHARACTERISTICS OF THE THREE TYPES OF MANIFESTATIONS

	Lepra reaction	Tuberculoid reaction	Borderline reaction
Onset:	Acute	Insidious	Acute, sometimes insidious
Constitutional symptoms:	Fever, malaise, prostration, headache, nausea, body aches, muscle and joint pains	Absent	Less intense than lepra reaction. Rarely severe
Skin lesions:	Exudative exacerbation of nodules, plaques and infiltration, erythema nodosum leprosum, pemphigoid, pustulating and/or ulcerating lesions	Pre-existing plaques swollen, enlarged and erythamatous and tender, new lesions appear. Oedema in and around lesions Rarely ulceration of lesions	Polymorphic lesions, erythematous, violaceous circinate, concentric, geographic, or psoriasiform oedema in lesions, ulceration of lesions. Rarely ENL and pustulation
Extracutaneous manifestation:	Neuritis, lymphadenopathy, iridocyclitis, orchitis, hepatosplenomegaly, arthritis, nephritis, oedema limbs, tendency to recurrence	Neuritis of cutaneous and regional nerve trunk. Nerve abscess. Rarely regional lymphadenopathy	Neuritis, arthritis, lymphadenopathy, oedema. Rarely systemic involvement
Prognosis:	Increased morbidity and mortality. Paralytic and non-paralytic deformities from contractures resulting from deep seated inflammatory reaction in the hands and feet and arthritis of MP, PIP. Rarely nephropathy from amyloidosis	Paralysis of muscle groups supplied by peripheral nerve trunk involved. With recurrence, pass on to 'B' type	Tendency to assume 'L' forms. Multiple paralytic deformities

because of rebound phenomenon on withdrawal or sometimes on lowering the dose as low as even ½ a tablet of the drug and a psychic dependence on the drug. This leads to long term steroid therapy being beset with impending complications such as cushingoid syndrome, osteoporosis with a risk of fracture, glycosuria, perforation of peptic ulcer, reactivation of old tuberculous foci, sodium retention and posterior capsular cataract. Another unfortunate point is the steroids given either locally or systemically even in the young patients can cause glaucoma and permanent loss of vision (Brown and Hogerzeil, 1962). It can also potentiate the action and penetration of virus (Copeman *et al.*, 1964).

PUSTULATING AND ULCERATING LESIONS :

For threatening or manifest pustulations and ulceration in lesions, the additional use of antibiotics, commonly penicillin and or streptopenicillin, are of benefit even though pyogenic organism are not isolated from these lesions. In some cases chloramphenicol might have to be used.

RECURRENT LEPRA REACTION OR CHRONIC REACTION :

The measures aimed at control of recurrent reaction consist of the administration of an antimalarial drugs (chloroquine) orally in dose of 1 tablet supplemented with 100 mg. of I.N.H. I.N.H. has antileprosy activity and does not provoke reaction. It must, however, be remembered that chloroquine toxicity includes besides malaise, headache, nausea, vomiting, ocular complications like corneal opacities and sometimes irreversible retinopathy and rarely neuromyopathy. Fortunately, corneal opacities clear on suspension of treatment, and neuromyopathies and retinopathies are known to occur if the treatment is continued for more than a year. When the patient is free from reactive episodes dapsone is introduced in 1 mg. doses once weekly. Later, the dose is increased to two times a week. At periods, as judged by the patient's response commonly, fortnightly the dose is administered on alternate days and still later daily. The dose is further increased after long stages to the maximum tolerated dose. It has been observed that even such small doses as 1 mg. to 5 mg. daily are definitely effective in improving the clinical condition and a concurrent fall in bacteriological status. However, it should be the aim to increase the dose to 25 mg. daily and not to be complacent with the improvement as recrudescence of activity of the disease has been seen in a few cases who had made satisfactory progress (Ramu, 1967).

THERAPY OF CASES WITH RECURRENT PUSTULATION:

In these cases the use of a long acting sulphonamide e.g., sulphadimethoxine, administered in a dose of 0·5 g. to 1 g. daily has been found to be of value in controlling and preventing the recurrence of pustulating skin lesions. Incidentally, this measure has also been of benefit in preventing the attacks of arthritis. The rationale behind the use of antibiotics or sulphonamides is that these lesions seem to be monitored by a focus of infection somewhere in the body. They do not however prevent the occurrence of reactive episodes themselves.

THERAPY OF STEROID DEPENDENT CASES :

The very difficult task of weaning the steroid dependent patient is effected by giving the steroid in powder form in gradually decreasing doses mixed with progressively increasing doses of chloroquine, the latter being used as a decoy because of the bitter taste of both drugs. The dose of steroid is finally tapered off but that of chloroquine is kept on till finally this is also withdrawn. All the while dapsone must be given in the small doses as mentioned above, and ultimately increased to a dose of 25 mg. a day (Ramu and Ramanujam, 1970).

THE USE OF B663 :

In recent years it was found that B663, a derivative of the anilene dye aposafranine, has proven antituberculous activity and also antileprosy activity. On a finding (Brown and Hogerzeil, 1962 a) that the incidence of ENL was lower in those treated with the drug, it has been found by several workers to have anti-inflammatory, and immunosuppressive activity (Working Party Report, 1969). In reactions in leprosy, the individual dose required to suppress the reaction has to be determined starting with 200 mg. daily for 3 weeks. If no response obtained in the reacting condition the dose is increased by 100 mg. When adequate response is found, the dose is slowly decreased. In reactors on steroid the steroid dose is continued till the condition is finally controlled on the appropriate dose of B663. Once the patient is free of reaction for a month an attempt is made to reduce the dose of steroid and finally taper it off. In our experience the effect of B663 is not dramatic. In severe cases B663 has to be given in dose of 400 mg. or 500 mg. daily in divided doses along with appropriate doses of an efficient anti-reaction drug and an antibiotic in cases with a pustulating component. The antibiotic is withdrawn first and later the steroid is tapered off. If the patient has not been on dapsone, dapsone is introduced as mentioned earlier in small doses.

The side effects encountered on high doses of B663 consist a sense of heaviness in the abdomen and nausea which tend to pass off later. A distinct disturbing disadvantage is the appearance of red discolouration in the skin with more concentration of the drug in the infiltrated skin and mucosal lesions. In course of time the red colour turns into a dark charred tint. Ultimately, the aim is to increase the dose of dapsone to a maximum of 25 mg. daily and withdraw B663. Apparent resistance of *Myco. leprae* to B663 has been observed in 5 out of 16 patients who had earlier satisfactory progress (Brown and Hogerzeil, 1962b).

TREATMENT OF ACUTE EYE MANIFESTATIONS :

In some patients and in some countries iridocyclitis is common and calls for immediate attention. A red painful eye suggests either ENL in the eye, scleritis and/or iridocyclitis. Patient should wear an eye shade, have boric fomentation and the pupil should be kept dilated with 1 per cent atropine drops or ointment. Intra-ocular tension should be tested regularly and if found high, acetazolamide (diamox) should be used. Systemic and topical steroid therapy is indicated in this condition when vision is imperilled. The use of non-steroid anti-inflammatory drugs like phenylbutazone, oxyphenbutazone or indomethacin has very gratifying results.

TREATMENT OF ACUTE PAINFUL NEURITIS :

The nerves are excruciantingly painful and exquisitely tender. Many nerves may be involved, but most commonly the ulnar nerve is hit. In addition to the routine treatment of the reaction, local application of heat in the form of hot compresses or diathermy, simple warmth by warm wrapping and splinting the part with the nerve in the relaxed position help in alleviating the pain over the affected nerve. Cooling of the skin over the painful stretch of involved nerve by spraying ethylchloride relieves the pain and can be repeated 2 or 3 times daily.

Perineural infiltration of novocain and a vasodilator drug, e.g., ½ ml. of novocain and 2 ml. of isoxsuprine hydrochloride (duvadilan) or talazoline hydrochloride (priscol) is found to relieve this distressing condition if a single nerve is involved. Nicotinic acid 250 mg. twice a day after food administered routinely is helpful in cases prone to develop neuritis. Its use is because of its vasodilating properties. Injections of vitamin B12, B1+B6 are employed on an empirical basis. As inflammatory oedema may be the cause of pressure on nerve fibres and the consequent pain in cases associated with much exudation. Acetazolamide or a thiazide compound given as a single dose in the morning is of benefit in relieving oedema and consequently the pain. In acute nerve palsies arising during reaction, the limb is splinted in the functional position followed by exercises. With the treatment mentioned above, there is not only relief of pain but recovery of paralysis is gratifying in many cases.

REACTION HAND :

Deep seated inflammation in the subcutis during the acute phase gives rise to a painful swelling (Ramu and Ramanujam, 1964). During this phase treatment is by splinting the hand in the functional position and keeping the limb elevated and the use of a diuretic (thiazide).

In cases with recurrent attacks of "Reaction hand" following the reactive episode contractures develop, the skin is thick and fibrotic and pulls the fingers in different directions to produce deformities. Following the acute phase, physiotherapy helps to prevent contracture. In early contracture the injection of a depot corticosteroid along with hyalase locally twice a week accompanied with physiotherapy may be of help (Ramu, 1967).

When a provocative agent for the reactive states is identified e.g., a septic focus or filariasis, it should be treated. The dose of DDS should be individualised to the maximum which is tolerated by the patient.

SUMMARY

A short resume of the provocative agents of reactive states and the types of reaction are enumerated.

Therapy of the acute phase with anodynes, antimalarials and antimonials are detailed. Antibiotics are indicated in pustulating or ulcerating lesions.

Therapy of recurrent subacute or chronic reactive states, using an antimalarial, INH and the introduction of DDS in very small doses is given.

The hazards of corticosteroid therapy are emphasised with its indications.

The treatment of ocular, neuritic and deforming complications is given.

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4

Surgical Problems in Leprosy†

H. SRINIVASAN*

Leprosy by itself poses few surgical problems. But the deformities and disabilities that follow the disease demand surgical attention. But for the onset of these complications it is very doubtful that leprosy would have been considered as anything very special. If there were no deformities or disabilities accompanying the disease it would not be feared so much and would have been passed off as just another skin disease.

Deformity is not invariably associated with leprosy, i.e., not every patient with the disease suffer from deformity or disability. In fact only about 30 per cent of the patients have significant deformity or disability. Of these deformtiies many are now correctable by reconstructive surgery. Others, which are difficult to correct, are luckily avoidable. In other words, deformities are neither inevitable nor incurable.

Deformities are seen more often in patients with extensive or uncontrolled disease where there is multiple nerve trunk involvement and in those who show complications like reactions or intolerance to dapsone. Deformities are also seen more commonly in patients indulging in heavy work (skilled or unskilled) and those who are, for some reason, deficient in taking care of themselves.

Therefore, if the incidence of deformity is to be brought down it is necessary that the disease is diagnosed early and adequately treated and complications like reaction and neuritis are recognised early and appropriately treated. Treatment of leprosy must therefore be carefully supervised and adjusted according to the individual patient's condition. Further, the patient must be educated regarding methods of prevention of the preventable deformities. Taking care of the anaesthetic extremities, avoiding injury to the same by over-use,

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† Lecture delivered at the Refresher Course in Leprosy held at Chingleput on 25-3-1972

* F.R.C.S. (Eng.), F.R.C.S. (Edin.), Senior Orthopaedic Surgeon, C.L.T. & R.I., Chingleput

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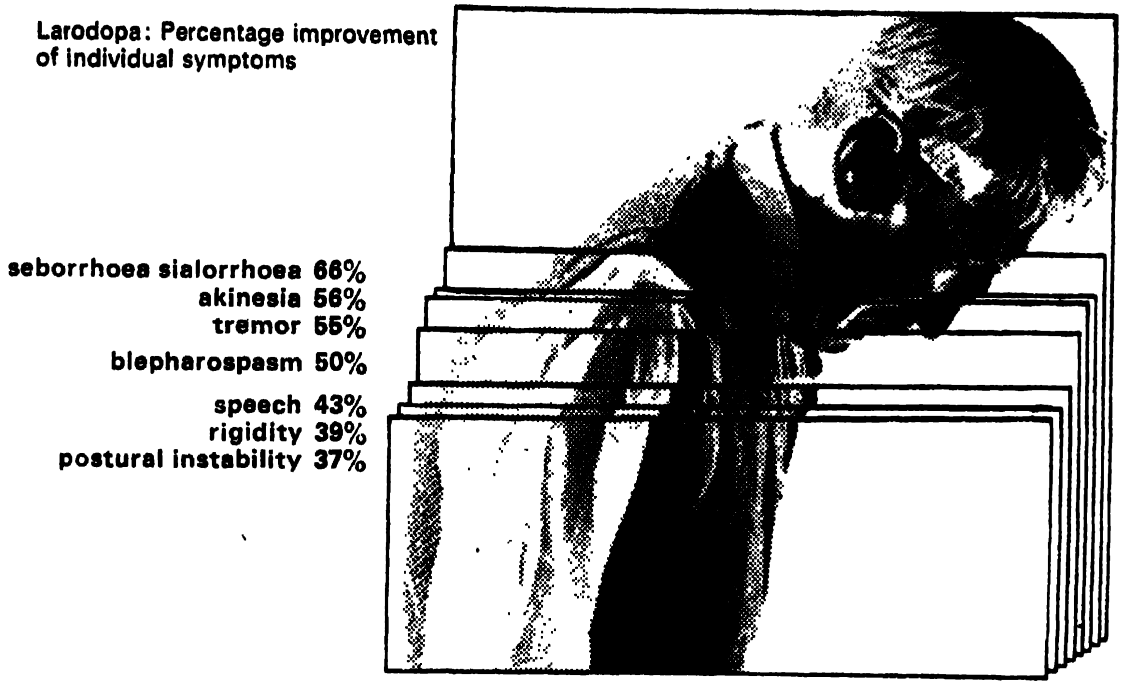

McDowell, F., et al., Ann. Intern. Med., 1970, 72, 29.

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absent minded use or misuse, recognising injuries when they have occurred and proper treatment of the same are essential steps in preventing deformities.

Deformities occur in leprosy patients from a number of causes, and the type of deformity varies accordingly.

(A) *Specific deformities*—These arise because the affected part is involved in the disease process and are seen in lepromatous leprosy as the result of the effects of lepromatous granuloma in the skin. Examples are : Loss of eyebrows, nasal deformity, sagging face and sagging ear lobes.

(B) *Paralytic deformities*—These result from damage to motor nerves by the disease. Though these are considered to be typical of non-lepromatous leprosy, they are also seen in lepromatous leprosy but late in the course of the disease. Examples are : Claw fingers, ape thumb, drop foot, drop wrist and lagophthalmos. It must be remembered that these deformities indicate only that a particular motor nerve is damaged and do not indicate the cause of damage or even leprosy.

(C) *Anaesthetic deformities*—These arise as late sequelae of injuries to anaesthetic extremities. Injuries tend to be neglected and infection supervenes, all because of anaesthesia, leading to tissue destruction and scarring which gives rise to deformities. Examples are : Contractures of fingers shortening of digits, fixed deformities of hand and foot and mutilation of these parts. These deformities are difficult to correct but can be prevented in the first instance by avoiding injuries and taking proper care of them once they have occurred.

(D) *Gynaecomastia*—It is sometimes seen in lepromatous patients who have suffered from leprous orchitis. This results in testicular atrophy, endocrine imbalance and hypertrophy of the breast tissue.

SITES OF DEFORMITIES :

Deformities are seen in face, feet and hands, in that order of increasing frequency.

Facial deformities are seen mostly in lepromatous patients. Except for lagophthalmos, the facial deformities are due to lepromatous granuloma in the skin. Hand deformities are mostly paralytic in origin. Often there is, in addition, injury and scarring. Feet suffer most often from neuropathic (trophic) ulceration which occurs because of injuries and walking strains. Many of the other deformities of the foot and toes result from repeated ulceration. Besides ulceration, scarring and its consequences (like fixed deformities of toes and foot or even disorganisation of the foot), drop-foot due to damage to lateral popliteal nerve is seen in a small proportion of patients.

TREATMENT

The deformities, once they are established, have their own natural history and are not influenced by the course of leprosy. Reconstructive surgery is needed for correcting most of these deformities and improve the disabilities. Various methods are used for this purpose. Plastic surgical techniques are used for cosmetic correction and involve replacing lost tissue, rearranging existing tissue and removing excess tissue. Tendon surgery, like tendon transplantation and grafting, is used to correct paralytic deformities provided the deformity is mobile. In cases of fixed deformities, surgery of bones and joints is necessary to correct the deformity and stabilise the part. But reconstructive surgery cannot, unfortunately, restore sensation to anaesthetic areas and the patient will have to take good care of his hands and feet even after surgical correction. Otherwise he is sure to land himself in trouble.

Before corrective surgery is done the patient must have had treatment and the disease must have been brought under control. The patient must also be free from other complications like reactions, or scabies. The part to be corrected must be mobile, without stiffness of joints, in case of paralytic deformities. For plastic surgical procedures, the patient must have become negative.

Reconstructive surgery is an exacting branch of surgery and for this to be successful other necessary requirements are : (i) Help of a physiotherapist, (ii) surgeon trained in the techniques, (iii) adequate facilities for surgery, and lastly (iv) co-operating patient who can intelligently follow instructions for proper postoperative re-education.

Face—Conditions commonly seen in the face are loss of eye-brows, nasal deformity, sagging face and ear lobes. These are corrected by plastic surgical procedures, e.g., transplantation of hair bearing skin for replacing lost eyebrows; providing internal lining and supportive frame work for correcting nasal deformity ; removal of redundant skin and subcutaneous tissue for correcting sagging face ; and reduction of ear lobes.

Paralytic deformities — These are corrected by muscle substitution. The tendon of a normal muscle is re-routed in such a way that this muscle now mimics the action of the paralysed muscle. Tendon transfer operations will be successful only if the joints are freely mobile and not stiff. If there is any stiffness this must be corrected first by pre-operative physiotherapy.

Lagophthalmos—This is due to paralysis of orbicularis oculi resulting from damage to facial nerve and leads to epiphora, exposure keratitis and corneal ulceration. Lagophthalmos is corrected by making use of the temporalis muscle to function in place of the paralysed orbicularis oculi. Part of the temporalis muscle is shifted and attached to the eyelids and medial palpebral ligament by means of temporalis fascia, used as a free graft.

Claw fingers—These result from damage to ulnar nerve and consequent paralysis of the intrinsic muscles (interossei and lumbricals) of the fingers. The fingers become clawed (hyperextended at the base and flexed in the middle and distal joints) and disabled because they cannot attain functionally useful positions. For correcting this condition it is the usual practice to transfer either muscle acting on the wrist (extensor carpi radialis) or on the digit (flexor digitorum sublimis). The tendons of these muscles are lengthened by a free tendon graft when necessary, and re-routed so that they run in the same course as the lumbrical tendon and are attached to the extensor expansion of the digit, just like the lumbrical.

Paralysed thumb—Median nerve damage is quite common in leprosy and the thenar muscles get paralysed, giving rise to serious disability. The thumb cannot be lifted off the palm and the pincer mechanism of the hand--thumb opposing the other fingers for holding an object between them—is lost. This is corrected by transfer of flexor digitorum sublimis whose tendon is re-routed in such a way that the paralysed thumb is re-activated and becomes useful once again.

Drop wrist—This is seen only rarely and is due to damage to radial nerve and paralysis of wrist and digital extensors. Transfer of pronator teres to wrist extensors and flexor carpi radialis to digital extensors corrects this condition.

Drop foot—This is more common than drop wrist and is due to damage to lateral popliteal nerve and paralysis of the extensors and evertors of the foot. The posterior muscles (plantar flexors, invertors and digital flexors) are not affected. Drop foot is satisfactorily corrected by anterior transposition of one of these muscles, viz., tibialis posterior.

In case of fixed deformities (of fingers or feet) and in case of disorganisation of major joints giving rise to instability of the part, muscle substitution will not help. Arthrodesis of the affected joints with or without the use of bone grafts is the only way of correcting these conditions.

Reconstructive surgery can also be used for preventing frequently recurring plantar ulcers. In these cases, each foot and even each ulcer will present unique features which must be taken note of and the corrective procedure must be carefully planned accordingly.

Gynaecomastia--This results from leprous orchitis and testicular atrophy and remains permanent. The hypertrophied breast tissue cannot be made to shrink by medical treatment and excisional surgery is necessary to get rid of it. The breast tissue can be removed through an inconspicuous intra-areolar incision which leaves an almost invisible scar.

The results of reconstructive surgery are, on the whole, quite satisfactory and leprosy patients need not any longer fear the disease or its complications. Once this is realised, leprosy will lose its pre-eminent position as 'The Disease' and will become just a disease and the leprosy patient will be treated as any other patient. For, the aim of reconstructive surgery is not just to correct a deformity but to restore a disabled member back to his normal place in society.

CASE NOTES

1

Multiple Haemangioma of the Bowel

V. K. SINGHAL*, V. K. ARORA**
S. B. AGARWAL***, I. K. DHAWAN****

Haemangiomata of the gastro-intestinal tract are rare. They may be present as a part of general haemangiomatosis as in Osler-Rendu (Driscoll and Rabe, 1954) or Porkes-Weber-Klippel syndrome (Shepherd 1953), causing gastro-intestinal bleeding. They may exist as such, and commonly present as melaena (Kreysel, 1962, Calem and Jimenez, 1963). Rissier (1959) compiled the largest series so far reported of gastro-intestinal haemangioma, and described 116 cases.

In this report it is proposed to present a case of multiple intestinal haemangiomata, presenting as occult bleeding, leading to severe anaemia.

CASE REPORT

A 15-year-old boy, V.K., (C. R. No. 14598) was admitted to the All India Institute of Medical Sciences on 4-8-1970 with recurrent episodes of weakness and pallor, giddines and facial twitchings every 2-3 months for the past 10 years. He had never observed darkening of his stools or any other haemorrhagic disorder.

On examination, the patient was very pale and semiconscious. He had a pulse rate of 84 per minute and blood pressure of 116/80 mm. Hg. There was no lymphadenopathy or cutaneous naevi. Examination of the nervous system revealed no deficit. The liver and spleen were not palpable and a rectal examination was negative.

Investigations—Haemoglobin was 6 g. per cent, with an ESR of 35 mm. at the end of first hour (Westergren). Stools were brown but showed a persistent positive benzidine test for occult blood. Barium meal and enema ex-

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aminations were normal. On sigmoidoscopy two haemangiomata were seen 20 cm. and 10 cm. from the anal verge respectively. These were sessile, blue and protuberant and about 1·5 cm. in diameter. These were transfixed and ligated on 16-9-1970.

Management—He remained well for three months. He was readmitted on 16-1-1971 with the same complaints and physical findings as on the first occasion. Haemoglobin was 5 g. per cent and sigmoidoscopy was normal. Stools were brown, but showed the presence of occult blood. In view of the presence of rectal haemangiomata and persistent occult blood in stools, it was considered that the patient may have other haemangiomata in the gastrointestinal tract. A laparotomy was performed on 19-1-1971, and 46 haemangiomata were counted evenly distributed along the entire length of the small bowel and colon. There were none in the stomach, duodenum or other abdominal viscera. The haemangiomata appeared as bluish circumscribed lesions seen through the serosa, and could be felt between the fingers. Each one was about 1 cm. in diameter and protruded into the lumen. About half the lesions were excised through multiple enterotomies done at the base of each haemangioma. A second laparotomy was done on 16-2-1971 and the remaining palpable lesions were excised. Biopsy of excised lesions showed them to be capillary haemangioma (Fig. 1).

Nine months after the second operation, the patient remains in good health with a haemoglobin of 10 g. per cent. The stools, however, showed occult blood. It would thus appear that a few lesions are still present giving occult blood in stools, but not enough to cause severe anaemia.

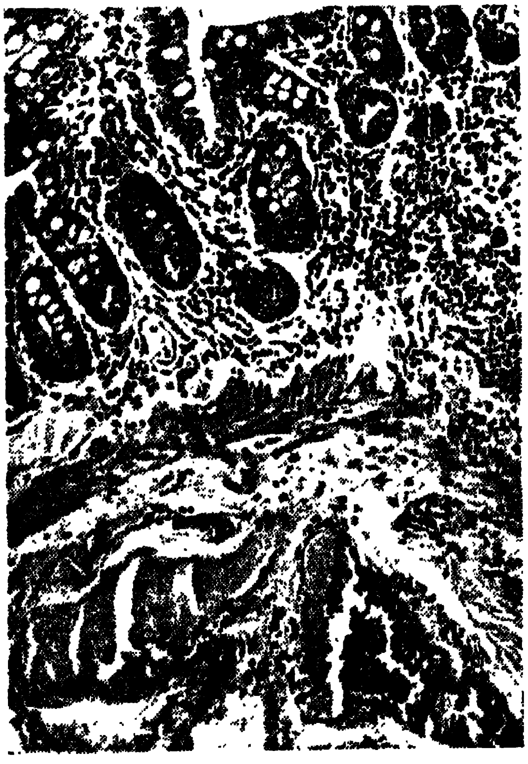

FIG. 1—SHOWING HISTOLOGY OF CAPILLARY HAEMANGIOMA

DISCUSSION

It is generally agreed that intestinal haemangiomata result from congential malformation and are present at birth (Shephered, *loc. cit.*; Dwyer and Steinlauf, 1964). Two thirds of Rissier's (*loc. cit.*) cases were multiple or diffuse, sixteen were capillary and forty-eight cavernous.

Visible cutaneous or oral haemangioma may arouse a suspicion (Heycock and Dickinson, 1951 ; Rickham, 1952). Endoscopic examination of the rectum and colon may provide the first clue, as was demonstrated in this case. Dwyer and Steinlauf (*loc. cit.*) showed the presence of calcified phleboliths on x-ray examination.

In most cases the haemangioma is found at laparotomy. Transillumination of the bowel by cold fibre-optic light may help to display the haemangioma (Cook, 1964 ; Dwyer and Steinlauf, *loc. cit.*). Vetto (1962) advocated the application of a sterile glass slide to the bowel wall to allow visualisation of spider angioma. In the case presented, a large number of lesions were detected by careful palpation of the entire length of the gut between the finger and the thumb.

Successful resections have been reported by Pierose (1940), Lazarus and Marks (1947) and Rickham (*loc. cit*). Resection or local excision was carried out in half the patients reported by Rissier (*loc. cit.*). Calem and Jimenez (*loc. cit.*) emphasised that surgical excision remains the only means of cure.

In the case reported the haemangiomata were excised by multiple small enterotomies.

SUMMARY

A patient with multiple small capillary haemangiomata of the small and large bowel is reported. The patient presented with severe anaemia and occult bleeding. Diagnosis was suggeted by a sigmoidoscopy. The haemangiomata were removed by two laparotomies done at an interval of four weeks.

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2

Multiple Urethral Fistulae, an Unusual Early Presentation of Stevens-Johnson Syndrome

PREM KUMAR AHUJA*, MANSOOR HASAN**
R. N. GUPTA***

Stevens and Johnson in 1922 described a new eruptive fever characterised by pleomorphous rash, ulceration of mouth, purulent conjunctivitis and severe constitutional symptoms. This is regarded as a severe form of erythema multiforme involving the skin, mucous membrane of eyes, mouth and urethral meatus, etc., along with high continuous pyrexia and constitutional symptoms.

From time to time cases of this syndrome have been reported in the medical literature. The pathogenesis remains unclear. Two aetiological types are generally accepted:

1. Idiopathic, where no obvious cause can be found and
2. Secondary, where it is secondary to administration of drug, sera or associated with infections (Billow and Lowen, 1952; Short, 1957; Cohlan, 1960; Dubb, 1961). It often seems to be an expression of allergy or hypersensitivity reaction to drugs, mainly, aspirin, sulphonamides (Ashby and Lazar, 1951), phenobarbitone (Mauriello, 1954), penicillin (Yaffee, 1959) and chlorpropamide (Yaffee, 1960).

There are few reports in Indian literature of this syndrome (Sainani *et al.*, 1970). We report here an unusual presentation of this syndrome, i.e., multiple urethral fistulae as the dominating clinical presentation, later on developing other manifestations attributable to this syndrome.

Case Report

Mr. S. R., a 22-year-old muslim male, was admitted on 6-6-1970 in the Isolated Ward, Gandhi Memorial and Associated Hospitals, Lucknow. Twelve days prior to admission the patient had a stye in one eye with a gritty sensation, watering and itching. An ophthalmologist advised tablet sulphamethoxypyridazine—1 tablet twice daily. Eight days after starting medication the patient developed high fever and generalised weakness. The patient first noticed eruptions and swelling over the genitals soon followed by a generalised swelling of anogenital area within 24 hours and the development of fistulae over the penile urethra within 48 to 72 hours. Rashes started appearing on 3rd day over the extremities, abdomen and face and soon assumed a bullous form.

Physical examination revealed a moderately built, febrile, ill looking man. His pulse rate was 126/minute, regular, blood pressure 110/90 mm. of Hg and the respiratory rate was 22/minute. Ulceration of both upper and lower eye-lids was present with a mucopurulent discharge. Bullous eruptions of variable size were present all over the abdomen, extremities and the face (Fig. 1).

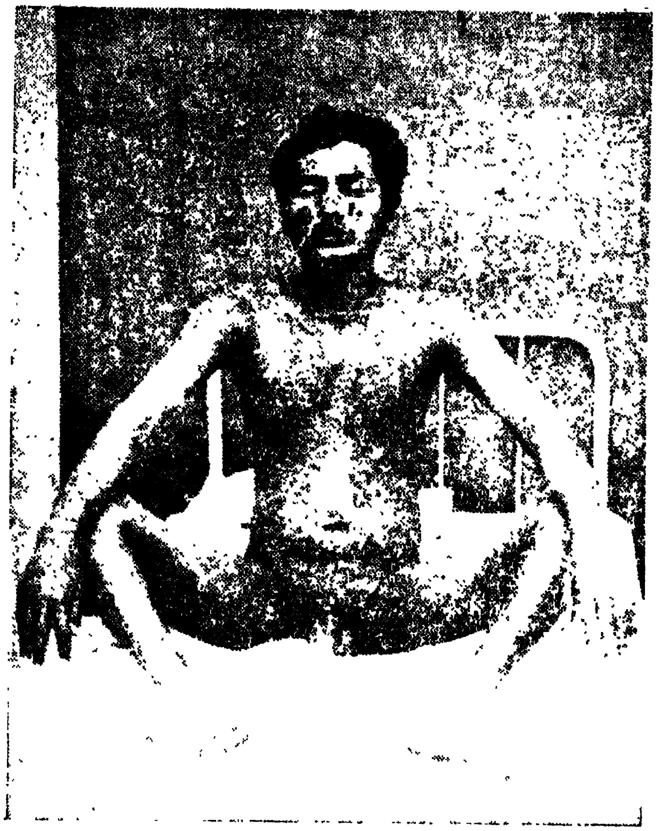

Fig. 1

Examination of anogenital area showed marked sloughing of mucous membrane, bullous eruption and multiple fistulae from the penile urethra discharging urine (Fig. 2). The oral cavity showed a few small ulcers with some sloughing of the oropharyngeal mucosa. Systemic examination did not reveal any significant abnormality.

Investigations—The total leucocyte count was 20,300/c.mm. with polymorphs 68 per cent, lymphocytes 24 per

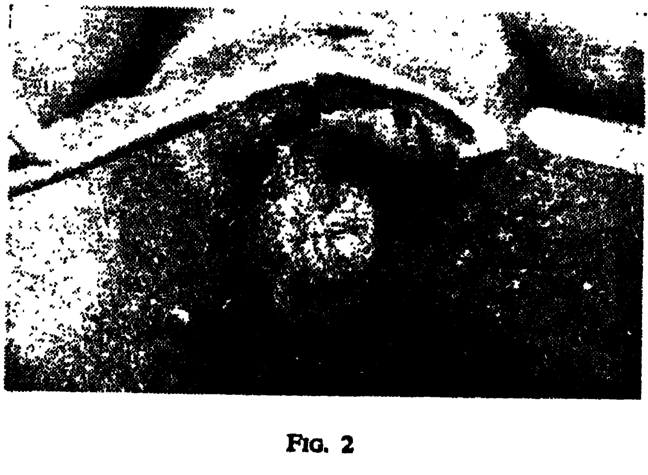

Fig. 2

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cent and eosinophils 8 per cent. Haemoglobin was 11 g. per cent. Urine and stool did not reveal any abnormality.

Diagnosis—The patient was diagnosed as a case of Stevens-Johnson syndrome. Aspiration of bullous fluid and smears from the wall of bullae were negative for zank cells. This made the diagnosis of acute pemphigus unlikely though it was initially considered as the second possibility. The milder varieties of erythema multiforme were not considered because of the rapidity of onset, constitutional symptoms and the predominant bullous rash. Triple symptom complex of Bechet, characterised by the triad of genital ulceration, uveitis and involvement of central nervous system was considered unlikely as the patient had no uveitis and no involvement of the central nervous system. The disease has not recurred for the last one year or so.

Management and follow-up—At the time of admission continuous urinary discharge from the multiple urethral fistulae seemed to be the main clinical problem. An indwelling catheter was passed per urethra for maintaining a proper drainage.

The patient became critically ill on the third day of admission with respiratory distress, cyanosis and hypotension. The bullous eruptions increased in number and became widespread over the extremities, face and abdomen. There was no depigmentation. Oxytetracycline hydrochloride, corticosteroids along with I.V. fluids, oxygen inhalations were given with a strict watch over vitals and general nursing care. The general condition showed some improvement on the 7th day of admission with reduction in respiratory distress, cyanosis and toxaemia. About the same time the patient started showing exfoliation of skin all over the body. The patient became apyrexial on 14th day of admission. He was given minerals and vitamins.

The discharge of urine from the fistulous openings gradually reduced and healing of almost all the fistulae was complete by 25th day. It was remarkable that on removal of indwelling catheter there was no discharge from the urethral fistulae. The patient was discharged on the 30th day of admission without any residual complaint though antibiotics were prescribed for urinary tract infection observed during his stay. The fistulae were completely healed and there was no stricture formation. The patient is asymptomatic for over a year now.

DISCUSSION

Cases of Stevens-Johnson syndrome have been reported from all over the world. Only a few reports have appeared in the Indian literature. The case presented here had an unusual presentation of this syndrome viz., multiple urethral fistulae.

Over a dozen of cases of severe bullous erythema have been reported in association with sulphamethoxypyridazine (Lindsay *et al.*, 1958; Garner, 1959, Cohlan, *loc. cit.*; Dubb, *loc. cit.*; Maher-Loughnan and Tullis, 1960). Other severe reactions also occur and are unrelated to the dosage of drug or to the duration of therapy. Major reactions reported, include skin eruptions, blood dyscrasias (Schwartz and Norton, 1958); interstitial myocarditis and hepatitis (Tisdale, 1958). Reactions to sulphamethoxypyridazine reported have caused five fatalities: two from myocarditis (Blanchard and Mertens, 1958), and one each from aplastic anaemia (Holsinger *et al.*, 1958), thrombocytopenic purpura (Janovsky, 1960) and septicaemia with severe bullous erythema multiforme (Salvaggio and Gonzalez, 1959).

The prolonged action and slow excretion of long acting sulphas may make this drug more toxic than short acting sulphas (Lindsay *et al.*, *loc. cit.*).

In the case presented here rapid sloughing of urethral mucosa and fistulae formation was one of the main presenting feature. Such an early and rapid sloughing of genital mucosa with multiple urethral fistulae formation within 48-72 hours has not been reported earlier. It was gratifying to observe that fistulae healed without any residual strictures within four weeks or so. Corticosteroids and antibiotics are often used in this condition though their exact value remains to be established. It appears that in the presence of severe constitutional symptoms such as occurred in this patient, use of corticosteroids would be justified (Librach, 1955). High doses of corticosteroids do not seem to have affected the healing of the urethral fistulae.

SUMMARY

A case of Stevens-Johnson syndrome following sulphamethoxypyridazine therapy presenting with an unusual manifestation viz., multiple urethral fistulae, has been described. The fistulae developed within 48-72 hours of the onset of symptoms. The fistulae healed remarkably well without any residual leakage of urine within a period of four weeks. No strictures have been noted on the follow-up of the patient for over one year.

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JOURNAL OF THE
INDIAN MEDICAL ASSOCIATION

CALCUTTA, NOVEMBER 1, 1973

Dr. Gerhard Hansen

The year 1973 is the centennial of the discovery of *Mycobacterium leprae*. Dr. Gerhard Henrik Armauer Hansen, the then microbe hunter made this discovery when he was thirty-two years old working as a physician in a hospital at Bergen, Norway. The date of Hansen's discovery appeared to be February 28, 1873. The bacillus was named after him as Hansen's bacillus and the infection as Hansen's disease. Nearly 100 years before the discovery of *Mycobacterium leprae*, Schilling (1769) had suggested that the cause of leprosy was a germ. He could not, however, prove it. This disease was known to the ancient Hindus as *Kushta* and was mentioned in Ayurveda in which chaulmoogra oil was prescribed for its treatment.

In spite of the discovery of the organism a century ago, perhaps the first bacterium described as a causative germ of a disease, leprosy has still remained a dreaded disease with social ostracism of the sufferers and various superstitious beliefs, folklore and customs associated with it, such as God's wrath, sins of past life, heat, heredity, sex-acts during menstruation and so on. Extreme chronicity and incurability of the disease ; loss of sensation and disfigurement and deformity particularly of the face and extremities ; obscurity about the mode of transmission though the idea of transmission was first associated with this disease and absence of an effective drug for treatment were some of the factors responsible for perpetuation of the situation. Only within the last two decades that a fairly effective drug in the form of sulphones has been discovered.

Hansen studied medicine in Norway and learnt microscopy and dermatology in Germany and Vienna. He joined the Leprosy Hospital at Lungegaard, Norway as a physician in 1869 and later became its Director. In those days leprosy was widely prevalent in European countries. Hansen while examining specimens, taken from the skin nodule on the nose of a leprosy patient, under microscope discovered little rods and though Koch has not then formulated his postulates the organisms isolated by Hansen gradually began to be accepted as the aetiological agent of the disease. Even now Koch's postulates are not applicable to the leprosy bacillus as it cannot be satisfactorily cultivated ; however recently claims have been made for the successful cultivation of bacteria in the footpad of rats and mice.

The credit goes to Dr. Hansen to propagate the idea that the disease spreads by contact and was not hereditary. Accordingly, he advocated cleanliness and isolation of leprosy cases and these methods had actually helped his country to virtually eradicate the disease.

At present India is perhaps the most affected country in East Asia when the estimated number of leprosy patients is the largest in the world—1 million. Treatment of the afflicted in our country was not humane being vitiated largely by superstitious beliefs as mentioned earlier. It is the Christian Missionaries who for nearly a century have been trying to mitigate their suffering. The names of Rogers, Muir, Cochrane, Dharmendra on the scientific aspects and Mahatma Gandhi, Kumarappa and others on the social aspects deserve to be remembered in our country for changing the outlook on this disease and in some near future we expect that at least the people of the country will begin to recognise this disease as an infectious disease amenable to treatment like any other infectious disease.

Incidentally it may be mentioned that the I.M.A. adopted a resolution at its 47th All-India Conference urging the Central and the State Governments to view with great concern the social stigma and emotional deprivation of the leprosy cases and recommended certain concrete and effective measures to be incorporated in the national health planning.

We are taking this opportunity for paying our respectful homage to Dr. Hansen.

S. C. SEAL

CURRENT MEDICAL LITERATURE

Glucose Intolerance Retested (The Importance of Variability and a Vindication of Restriction of Dietary Carbohydrate)

JACKSON, W. P. U., KALK, J., WHISSON, A., HARDCASTLE, A. AND TOYER, M. G. (*S. Afr. Med. J.*, **46**: 2065, 1972) from Department of Medicine, University of Cape Town and Groote Schuur Hospital Observatory, Cape, comment:

The variability of blood glucose levels in some individuals under apparently identical conditions is discussed, and hence the difficulty of diagnosing diabetes or normality from a single glucose tolerance test. Neverthelsss, there are predictive values to be obtained from population studies. These are illustrated by the results of glucose tolerance tests (GTTs) repeated after one year on 112 subjects, who initially entered a diabetes survey.

Thirty-four of the original 40 borderline subjects were normal on retesting; only 2 had become diabetic on GTT. There was striking improvement among those diabetics who had dieted and lost weight, with significant reduction in mean GTT figures, and with 9 out of 15 having normal repeat GTTs; whereas among those diabetics who had not dieted there was no improvement in mean GTT levels, although 4 yielded normal repeat GTTs. We believe that simple dieting was highly effective in reducing GTT values, even allowing for the natural fluctuations of blood sugar.

Three of the 4 teenage diabetics on survey were normal on retesting. The lag storage curve was not reproducible—only one of the original 14 subjects still lagged on repeat testing. Control subjects, who had been normal in both initial screening and GTT, were still normal, and their mean GTT values were virtually unchanged.

Our two main conclusions concern the care needed to diagnose asymptomatic diabetes, and the value of simple dietary carbohydrate restrictions in the treatment of hyperglycaemia, whatever the weight status of the individual.

Diet of Insulin-Dependent Diabetics

WHARTON, C. L., WICKING, J., WILLS, H. R. AND MARTIN, F. I. R. (*Med. J. Aust.*, **2**: 707, 1972) from Royal Melbourne Hospital, observe:

In order to assess current practice, the diets of 55 insulin-dependent diabetics attending the diabetic clinic of a teaching hospital, and those of 55 age-matched controls were analysed in detail from a one-week's recall diet.

The younger diabectics' diets were similar to those of the controls, with a slightly increased intake of protein and fat, whereas the older diabetics ate less than the control subjects. The intake of carbohydrate, protein and fat declined significantly with age in the diabetic patients but not in the controls. The cost of the diabetic patients' diet was found not to be significantly increased. The nutritive composition was adequate in all groups.

The level of adherence to a prescribed "portion" type diet was poor in 53 per cent of young and 72 per cent of older diabetics, as a result of both increased and decreased carbohydrate consumption. There was a tendency for those diabetics with vascular complications to adhere more closely to their diet.

The results of this investigation and those of similar earlier studies emphasise the need to reassess current methods of dietary modification in insulin-requiring diabetics. The importance of devising a dietetic philosophy for each individual patient is apparent.

Phenformin in Insulin Dependent Diabetes

MEHROTRA, T. N., GUPTA, A. K. AND GUPTA, S. K. (*Indian J. Med. Sci.*, **26**: 822, 1972) from the Department of Medicine, L.L.R.M. Medical College, Meerut, India and S. N. Medical College, Agra, India, write:

Thirty insulin requiring diabetics were given 100 mg. of phenformin daily for four weeks either before or after a period of four weeks of inert capsules in a double blind trial. Ten patients noticed hypoglycaemia so that the dose of insulin had to be lowered. Phenformin helped in improving the control of diabetes with a significant stability in blood sugar levels. There was no evidence of increased ketosis or significant weight loss.

Glucagon Metabolism in Untreated Diabetes Mellitus

BUCHANAN, K. D. AND McCARROLL, A. M. (*Lancet*, **2**: 1395, 1972) from the Department of Medicine, Queen's University of Belfast, and Diabetic Clinic, Belfast City Hospital, state:

Plasma pancreatic glucagon was measured in controls and in untreated recently diagnosed diabetic patients during and after oral glucose-tolerance test. Significant suppression of fasting glucagon concentration was observed in controls after oral glucose, but not in diabetics. Severely insulin-deficient diabetics showed a significant rise in glucagon levels after oral glucose.

Hyperosmolar Hyperglycaemic Nonketotic Diabetic Coma

SHAH, S. S., DOSHI, H. V. AND KOTHARI, U. R. (*Indian J. Med. Sci.*, **27**: 244, 1973) from the Department of Medicine, M. P. Shah, Medical College and Irwin Group of Hospitals, Jamnagar, India, write:

The syndrome of hyperosmolar hyperglycaemic nonketotic diabetic coma (HHNK—coma) is a recently recognised medical emergency characterised by severe hyperglycaemia, hyperosmolarity and dehydration in the absence of keto-acidosis. The majority of the patients are elderly, having mild maturity-onset diabetes. Factors aggravating diabetes or inducing dehydration and hyperosmolarity precipitate HHNK-coma. The onset of coma is insidious and the patient may present with neurological manifestations. Dehydration is a constant feature. The blood glucose may be 1000 mg. per cent or even higher but ketosis is absent. Serum osmolarity ranges between 300 to 550 mOsm/kg. of water. Serum sodium and blood urea nitrogen are usually elevated. The insulin levels, in contrast to previous belief, are low. Free fatty acid, cortisole and growth hormone levels are also low. It is believed that the dehydration and hyperosmolarity play a significant role in the pathogenesis of HHNK-coma and prevention of the development of ketosis in this condition. A consensus of opinion is that the patients should be treated with liberal amount of fluids (at least to start with hypotonic fluids) and with moderate amounts of insulin.

Circulating Proinsulin and the "C" Peptide

Leader in Lancet (*Lancet,* **2**: 748, 1973) reads:

The possibility that insulin might exist in a precursor was first suggested entirely on theoretical grounds. Later all species examined, including man, were shown conclusively to make a precursor substance, proinsulin, which is converted within the islets of Langerhans into insulin itself. Proinsulin has a molecular weight of about 9000, and in the process of its conversion to insulin a peptide of approximately 3000 molecular weight—the "C" or connecting peptide—is broken off.

Proinsulin can now be measured with considerable precision in blood by immunoassay techniques, and such methods have shown that a relatively small proportion of the total insulin in blood is precursor—usually less than 30 per cent though levels may be somewhat higher during fasting. Since proinsulin has only a small fraction of the biological activity associated with insulin itself, its physiological importance in the normal individual is open to doubt.

Attempts to show changes in circulating proinsulin levels in diabetes have so far been inconclusive. Thus, in patients with mild diabetes no substantial changes in the ratio of insulin to proinsulin have so far been found, though increased proinsulin levels have been reported in some cases of juvenile diabetes.

A very different situation exists in patients with islet-cell tumours. Here a very large proportion of circulating insulin may be present as precursor substances—in some instances as much as 80 per cent of the total.

Already "C"-peptide determinations in the serum of diabetic patients on insulin have revealed that beta-cell function may partially recover in the first few weeks of insulin treatment. Monitoring of "C"-peptide levels in patients may be of some value in designing future insulin treatment; but, more importantly, such measurements will add substantially to knowledge of what goes wrong in the early stages of severe diabetes.

Obesity and Thinness in Children

STUNKARD, A., D'AQUILI, E., FOX, S. AND FILION, R. D. L. (*J. Amer. Med. Ass.*, **221**: 579, 1972) from the Department of Psychiatry, University of Pennsylvania and the Philadelphia General Hospital, Philadelphia, write:

Several social factors have been closely linked to obesity and thinness in adults. This study, based on 3,344 measurements of triceps skin-fold thickness found similar relationships in white urban children. Obesity was far more prevalent in the lower-class girls than in those of the upper class—nine times as prevalent by age 6. Similar though less striking differences were found between boys of upper and lower socio-economic status. The pattern of thinness among girls was similar to that previously reported in women, with significantly more thinness in the upper-class group. Among boys, as among men, there were no such differences. The remarkably early onset of class-linked differences in prevalence of obesity underlines the importance of attempts to prevent the disorder in childhood. These attempts should be directed particularly toward those at high risk because of their lower socio-economic status.

NOTES AND NEWS

Refresher Course on Leprosy at Chingleput

An interesting refresher course on the Role of Medical Practitioners in the Treatment of Leprosy Patients was held at Chingleput under the joint auspices of the Central Leprosy Teaching and Research Institute, and I.M.A. Chingleput Branch.

At the outset the Director of the Institute described the salient features of the leprosy problem in the country and the working of the National Leprosy Control Programme. In view of the magnitude of the problem he emphasised the need for involvement of general practitioners in the treatment of leprosy cases in their clinics. He invited the views of the members present as to the feasibility of this step and the difficulties they encountered in the treatment of leprosy patients in private practice.

Dr. Ramakrishnan, Professor of Social and Prevestive Medicine, Chingleput Medical College, said that medical officers in the Primary Health Centres were beset with so many other medical and public health problems that leprosy got the least priority. He thought that urban-based general practitioners were generally not interested in the disease, because leprosy sufferers were mostly indigent patients from rural areas. In his view the existing methods had failed to touch even the fringe of the problem and he wanted that anti-leprosy activity should be put on a war footing with mobilisation of more funds and personnel.

Dr. Padmanabhan Nair, Registrar in Medicine, Chingleput Medical College, said that response of leprosy to current day therapy was so slow that the doctor and the patients tended to lose faith. He stressed the need for evolving rapidly acting drugs.

Dr. K. R. Naidu (Tirunelveli) thought that one of the reasons for the patients' apathy towards treatment was its cheapness. Health education of the masses and encouragement of patients to go for treatment were very much needed.

Dr. H. Shama Rao (Madurai) said that often the doctors insisted on treatment, but the patients were indifferent to the same. Health education alone would not be of much avail in such cases.

Dr. Mundol Abdulla (Chingleput) suggested extension of financial incentives to the general practitioners who treated cases of leprosy and material aids to needy patients by way of supply of rice or other articles of food.

Dr. P. N. Neelan (Chingleput) observed that in his experience patients were co-operative and regular and it required the right kind of approach to make them undergo treatment. He opposed the view that leprosy was a rural problem and remarked that it was equally an urban problem.

Dr. G. Ramu, Secretary, I.M.A. Chingleput Branch, referring to the fears expressed by Dr. Parthasarathy namely that the stigma of leprosy might scare away other patients in the clinics, said stigmata of leprosy occurred at a much later stage of the disease. The idea of this refresher course, he said, was to help the doctors in arriving at an early diagnosis of leprosy, the treatment of which would effectively prevent the deformities and stigmata from occurring. The cases with stigmata could be referred to the leprosy control units, he observed.

Dr. S. Sen (Chingleput) deplored that the Indian Medical Association was not consulted in health matters like anti-leprosy campaign and this was one of the causes of lack of an integrated and effective campaign.

Dr. C. G. S. Iyer, Director of C.L.T. & R.I., said that the treatment of leprosy was like that of other chronic infectious diseases where treatment has to be carried out for a long time. He said that when practitioners examined their patients for any other disease, and diagnosed the co-existence of leprosy they could treat them without the unfounded 'scare' that is usually associated with the diagnosis of the disease. He assured that the expertise required by the practitioners in the diagnosis or treatment of leprosy would be forthcoming in a good measure from the Institute.

Epidemics on Rise in S-E Asia

Diseases once thought to be under control in India and the entire South-East Asia are reported to be on the rise again.

Malaria, cholera, smallpox, and even polio cases are increasing in most of the countries, according to the annual report of the World Health Organisation's regional centre in New Delhi.

The report says that malaria continues to rise in the region and there were "more than 1·5 million cases last year."

There has been a steady increase in the incidence of malaria in major towns in India and Sri Lanka the number jumped from 10,000 cases in October 1972, to 21,000 in January 1973, it is said.

There has been a sharp increase in the incidence of smallpox in India and Bangladesh and "as many as 324 cases in a single week reported from Calcutta alone."

"Efforts to contain the spread of cholera have not shown significant results so far," Dr. V. T. H. Gunaratne, W.H.O.'s Regional Director, has said.

All Health Services to Come Under One Agency

Public health services like health, family planning and nutrition will be put under one agency in the Fifth Plan for better co-ordination. This was disclosed by the Union Minister of State for Planning, Sri Mohan Dharia while speaking as the chief guest at the annual conference of the Maharashtra State Trained Nurses Association in the B. J. Medical College Hall, Poona.

Plans to Double Drug Production

Indian's drug production, which is worth Rs. 300 crores annually, would increase to Rs. 600 crores at the end of the Fifth Plan, Dr. L. K. Behl, Managing Director of the Indian Drugs and Pharmaceuticals Ltd., a Government of India undertaking, recently said in Calcutta. Dr. Behl said the annual per capita consumption of drugs in India was about Rs. 6 the lowest in the world. By the end of the Fifth Plan the per capita consumption, he said, would increase to about Rs. 9.

Government will not Take Over Drug Industry

Union Deputy Petroleum and Chemicals Minister Sri Dalbir Singh expressed the Government's inability to nationalise the entire drug industry in the country.

He was intervening in the discussion on a non-official resolution, sponsored by Mrs. Lakshmi Kumari Chundawat in the Rajya Sabha.

The minister said foreign firms had in their own way contributed to the development of medicine in the country. It was wrong to say that they had done harm to the well-being of the nation.

Explaining the Government's stand he said, the Government was all for encouragement of the public sector in this field but was against the nationalisation of the industry for reasons of high prices and non-availability of life-saving drugs. He informed there were 38 drug manufacturing foreign firms. They controlled 45 per cent of the entire drug production in the country.

Earlier, a strong demand was made by some members for the nationalisation of drug industry to check the prices and sale of spurious drugs.

Several members complained that the whole market had been flooded with spurious drugs and in most of the places life-saving drugs were just not available. There were also complaints against the drug pricing system. A demand was made that the responsibility of pricing as well as quality control of drugs should be entrusted to the Health Ministry.

Mystery of Ageing Disease

India-born Dr. J. Sri Ram, a biochemist at the National Institutes for Health (NIH), U.S., has made significant progress in unravelling the mystery of the amyloidosis.

Dr. Ram says autopsy records in the U.S. report traces of amyloid in more than 50 per cent of the bodies of persons 60 years of age or older. He says amyloid infiltrates the organs of the body, gradually displacing healthy cells. This physical obstruction process can eventually cause death.

Just how this protein substance is formed is one of the mysteries Dr. Ram is trying to solve. He is convinced that amyloidosis is the basic cause of loss of memory and senility among the aged.

Cancer-like Viruses in Mammal Cells

Animal cells commonly used in laboratory research can spontaneously produce viruses similar to those that cause cancer, scientists at the National Cancer Institute of U.S.A. recently said at New York.

They said these viruses could easily be transmitted to humans, perhaps constituting a "significant biohazard" to laboratory workers handling cell cultures.

The discovery tends to support the theory that all mammalian cells contain their own viruses, that viruses or the ability to produce them are part of the genetic inheritance. The question to be answered is how these viruses are turned on and off.

The report of the spontaneous production of viruses appears in a recent issue of the journal *Science* published by the American Association for the Advancement of Science.

The journal quotes the scientists as saying: "We wish to report that many commonly used mammalian cell cultures from various species are producing readily detectable amounts of type C viruses with biochemical and immunologic properties similar to those of known leukaemia-producing and sarcoma-producing viruses."

Discoverer of the Function of Thymus Honoured

Dr. Jacques Miller, a French-born Australian medical scientist who discovered the function of the thymus, has received the Paul Ehrlich-Ludwig Darmstaedter Prize for 1974, West Germany's highest scientific award.

Dr. Miller, who is head of the Department of Experimental Pathology at Melbourne's Walter and Eliza Hall Institute, an international centre of immunology and cancer research, shares the award with Professor J. L. Gowans, of Oxford University, England.

Dr. Miller's work on the role of the thymus organ opened up new chapters in immunology and cancer research. It permitted a classification of immunological diseases in man and an understanding of the body's immunological apparatus.

As part of his study of the thymus, Dr. Miller removed the organ from new-born animals. This led to his discovery that the thymus had the vital function of building up the numbers of white blood cells the lymphocytes which are essential to the body's defence against infection.

The effects of the removal of the thymus, as described by Dr. Miller were:

(1) Marked diminution of the total number of lymphocytes in the body.

(2) A higher susceptibility of the body to infection.

(3) An inability of the system to produce some types of antibodies and to reject grafts of foreign tissues.

(4) High susceptibility to some cancer-producing agents —an effect which linked the lymphocytes produced by the thymus with resistance to cancer in general.—*A.I.S.*

VII Annual Conference of Ophthalmological Society of West Bengal

The 7th Annual Conference of the Ophthalmological Society of West Bengal will be held on November 25, 1973 at 'Institute Chandernagore' at Chandernagore, Hooghly. Intending participants may contact Dr. S. N. Misra, Organising Secretary, Barabazar, Chandernagore, Dist. Hooghly, for detailed information.

XXIII Annual Conference of Neurological Society of India

The 23rd Annual Conference of the Neurological Society of India will be held at Ahmedabad on December 17-20, 1973. Detailed information may be had from: Dr. B. J. Damany, Organising Secretary, K. M. School of Postgraduate Medicine and Research, Sheth V. S. General Hospital, Ellis-Bridge, Ahmedabad-380006, Gujarat.

REVIEWS

Modern Problems in Ophthalmology, Vol. 10, Secondary detachment of the retina, volume editors, R. Dufour and others; Series editor E. B. Streiff, 1972, S. Karger, Basel, München, Paris, London, New York, Sydney, 24·3 cm.× 17·5 cm., pp. x+701, S.Fr. 160; $ 44·80; DM 145, £ 17·60.

Jules Gonin (1870-1935) will be remembered for all time to come as the pioneer worker in retinal detachment to whom we largely owe our present-day concept of aetiology and pathogenesis of this grave malady of the eye. His pioneering works in this field mostly stimulated the ophthalmologists all over the world to continue the research activities on this serious condition of the eye. In all fitness of things, the centenary of this great ophthalmologist was celebrated on the 17th September, 1970 in Lausanne. On this occasion, the Club Jules Gonin and the Swiss Ophthalmological Society jointly endeavoured to deal with the problems of secondary retinal detachment. The Club Jules Gonin concentrated on the new clinical and experimental research in chorio-retinal surgery and the clinical and therapeutic problems of atraumatic secondary detachment. The Swiss Ophthalmological Society devoted to traumatic retinal detachments and the local surgical treatment of diabetic retinopathy. The contributions presented by members and guests of these two learned societies which dealt with the various aspects of the above subjects were obviously of very high order and these had been incorporated in the present volume of 'Modern Problems in Ophthalmology'. The articles of this nicely edited book are profusely illustrated and give the latest information about the subjects dealt with.

This golden treasure containing original contributions of as many as 141 eminent workers in the highly specialised field of retinal detachment is invaluable to an inquisitive ophthalmologist and to all research workers on this subject.

RANABIR MUKHERJI

Diagnostic Considerations in Ancient Indian Surgery (Based on Nidanasthana of Sushruta Samhita)—By G. D. Singnal, L. M. Singh and K. P. Singh. Published by Dr. G. D. Singhal, 14, Sammelan Marg, Allahabad, 1972, 22 cm.× 14·5 cm. pp. xxv+250. Price Standard Edition Rs. 25/-, Student Edition (Paper back) Rs. 15/-, Library or Overseas Edition Rs. 45/- or £ 3.

This book is the third volume of a series of twelve to be published. It is a literal translation of the Nidanasthana of Sushruta Samhita, Sloka by Sloka. Each unit has a heading in modern terminology, comments and references as a ready help to the interested. In the introduction there is a four-line gist of each of the 16 chapters. Each chapter is prefaced by a summary of what follows and ends with suggested research problems.

Information on ancient Indian Surgery are known to western medical men in a vague and misconceived manner. The book will help to remove many misconceptions regarding Hindoo surgery. Amongst other things it will be seen that Sushruta and not Celsus was the first to describe signs of inflammation.

It is a great contribution to history of surgery. Care, precision industry have been spared to bring out Sushruta's concept.

Surgeons will look forward to the publication of the other volumes.

The book is well got up.

SUBODH DATTA

Handbook of Ophthalmology — By Dr. B. M. Chatterjee, 1973, Vijoya Publishing House, Calcutta, 22 cm.× 14 cm., pp. 6+346, Rs. 16·50.

The undergraduate students in medicine of our country will undoubtedly hail this new handbook of ophthalmology as it will meet their long felt need of a concise textbook in this specialised subject. Prof. Chatterjee with his long experience as a teacher, has done a commendable job in making a good compendium for beginners in ophthalmology in this small volume. Each chapter on eye diseases begins with a short resume of basic regional anatomy to help the student to get good grasp of the subject. The descriptions of the diseases are precise and very lucidly written. The visual pathway and its lesions, squint and nystagmus have been dealt with such a skill that an average student will have no difficulty in understanding the fundamentals of these comparatively difficult subjects. The students will particularly find the chapters on ophthalmic instruments, eye operations and common prescriptions very useful.

There are some minor errors like, 'Purkinje-Sanson image' has been mentioned as 'Purkinje-Samson image' (Page 10); tattooing for leucoma is not done by both platinum chloride and gold chloride in a case (Page 84) but by either of the two chemicals. The corneal ulcer has not been classed under the general heading of keratitis and as such may be confusing to a student. In these days of chemotherapeutic and antibiotic drugs, no patient having mucopurulent conjunctivitis in one eye can be advised to lie down on the affected side with a Buller's shield on the other eye as a prophylactic treatment to prevent infection in the good eye (page 43). It is difficult to get any idea about the pseudo-isochromatic charts of Ishihara from the figure (page 15); a coloured plate would have been more illustrative.

The book is surprisingly low priced in comparison to the quality of the production and is profusely illustrated. The illustrations have been largely borrowed from the standard textbooks on ophthalmology. The book could be made richer if author's own illustrations were used.

RANABIR MUKHERJI

Advances in Ophthalmology, Vol. 26, Edited by M. J. Roper-Hall, H. Sautter and E. B. Streiff, 1972, S. Karger, Basel, München, Paris, London, New York, Sydney, 24·3 cm.×17 cm., pp. x+362, S.Fr. 134, US $ 37·65, D.M. 120, £ 14·75.

This volume of Advances in Ophthalmology contains four intetesting original contributions and three exhaustive reviews. The original works include: study on fluorescein angiography and vascular malformations of the fundus by Dr. A. F. Betrix of Geneva; observations on the alterations of Bruch's membrane that can occur during life by Dr. W. Lerche of Hamburg; study of retinal detachment after extraction of intra-ocular, magnetic or non-magnetic foreign bodies by Drs. J. Scouras, R. Dufour and V. Thilges of Lausanne and studies on the development of the aqueous humour production and evacuation system in man by Dr. K. G. Wulle of Weisbaden. All these research papers are of very high standard and these will undoubtedly stimulate undertaking of further studies on these subjects in different institutions.

Among the review articles, Dr. R. J. Smith has painstakingly analysed all reports on primary glaucoma, published during 1960-1969. This exhaustive review embraces the incidence of glaucoma and its distribution in populations in various countries as also the different methods of its diagnosis and treatment. The reviews of Dr. A. Huber of Zurich on x-ray and visual field diagnosis in affections of the orbit, of seller and surpaseller regions, of the optic tract and of optic radiations and of Dr. H. S. Thiel of Kiel on hereditary epithelial dystropy of the cornea (Meesmann-Wilkie) are also exhaustive and uptodate.

This volume like all other previous volumes of Advances in Ophthalmology is invaluable to a research worker in ophthalmology.

RANABIR MUKHERJI

Application of the International Classification of Diseases to Dentistry and Stomatology, 1973, World Health Organisation, Geneva, 24×16 cm., pp. 113, £2, $4·80, S. Fr. 16.

This volume is a supplementary to ICD, Eighth Revision, so as to help mechanical or electronic coding and help dentists and stomatologists to find detailed subdivisions of various conditions pertaining not only to oral diseases but also manifestations of other diseases and to find all such conditions gathered together instead of being scattered as is in ICD.

This book provides both a tabular (numerical) and a comprehensive alphabetical list.

This book is essential for compilation epidemological data and is recommended for Dental Colleges and Medical Records Division.

L. K. GANGULI

Today's Drugs, Volume 3, 1973, British Medical Association, London, 21·5×13·5 cm., pp. viii+191.

This volume is the final of the series on today's drugs. The present volume specially deals with bronchodilators, mucolytic agents, levodopa, prostaglandins, glibenclamide and immunosuppressive drugs.

The articles written by reputed authors appeared in different issues of the *British Medical Journal* in the recent past. They are up-to-date, useful and authoritative and are readily available in handy volume.

Many of the drugs discussed, are, however, not yet been marketed for general use in our country.

L. K. GANGULI

Cerebral Control of Eye Movements and Motion Perception —(Bibliotheca Ophthalmologica, No. 82, Ed., E. B. Streiff, Lausanne)—Volume Editors: J. Dichgans, Freiburg and E. Bizzi, Cambridge, Mass, 24·5 cm.× 17·5 cm., xii+400 pp., S. Karger, Basel, Munchen, Paris, London, New York, Sydney, U.S. $ 33·60, £ 14·15, DM 96·00, S. Fr. 120.

This book contains the proceedings of a symposium on neuronal mechanisms of oculomotor control and motion detection with their perceptual correlates held in Freiburg i. Br. from July 20-22, 1971. In the introductory chapter the historical comments on the recording of eye movements and visuovestibular research during the last 70 years have been described with the special role of reticular formation in motor mechanisms. Previous researches on this subject had been carried out with animal experiments but recently work on human eye movement was made possible by an electrical method measuring ocular movements in vertical and horizontal planes. The volume contains 39 articles on physiology of oculomotor system and psychophysics of motion preception by 50 different authors. During the last two decades experiments have been carried out on cerebral correlation of eye movements and vision using both psychophysical and neurophysiological methods.

This book, though not much helpful to clinical ophthalmologists, will be of interest to physiologists and neuro-ophthalmologists to whom it is recommended.

Gopal Sen

Manob Mon (Vol. I, No. 2, April, 1973) Special Number on Sleep and Dream: Pavlovian Psychology. Edited by D. N. Ganguli, Academic Publishers, Calcutta, 21·8 cm.×14 cm., pp. 98, Rs. 6·00, 60 p., $ 2·00.

If anybody expects to learn anything new about sleep or dreams and dreaming discovered through Pavlovian approach in this special number of 'Manob Mon' he will be disappointed. There is one technical article on the subject by Prof. Dasgupta, quite good but nothing new and nothing Pavlovian in it. The other short one on sleep is an elementary one for lay public. The rest of the articles in this issue come from the same old long playing record on Pavlov that is being played since Pavlov received his posthumous blessings from Stalin in the late forties.

Ajita Chakraborty

Anatomy—By Samar Mitra, 1973, Academic Publishers, Calcutta, 26×19 cm., pp. x+296, Rs. 30·00.

The book is the first of its kind based on the conceptions of dissections. The diagramatic illustrations are capable enough to inspire the students to have an easy grasp of the subject.

To an anatomist some of the illustrations in the book are really meagre to express the idea and are expected to be elaborated in the next edition. International colour convention has not been followed.

B. N. Mukherjee

OBITUARIES

Dr. A. M. O. Ghani

Death took place of Dr. A. M. O. Ghani, an outstanding leader of the medical profession in Bengal, on 24-9-1973 following an attack of coronary thrombosis.

Born in 1903, Dr. Ghani had a bright academic career. After obtaining his M.B.B.S. degree from Calcutta Medical College, he settled down to practice in the Park Circus area of the city. Practice for him was more of a social work than a profession which endeared him to a large section of the poor and lower middle class people. It was to represent their cause that he entered the West Bengal legislature and served his constituency for a number of years being elected an M.L.A. for several terms on a C.P.I. ticket.

A mass leader, though he was, he was never indifferent to the cause of the medical profession and health service for the people. During each session of the State Legislative Assembly he would confer with the leaders of the I.M.A. and focus his considered views during discussions on medical and health matters in the Assembly. He was actively associated with the I.M.A. at various times as member of the Executive Committee of Calcutta Branch, member of Bengal State Council and Vice-President, Calcutta Branch. He was also a Vice-President of the Peoples' Relief Committee. A handsome person, with a lingering broad smile over his face, Dr. Ghani in his young days used to take keen interest in dramatic art, particularly in English drama, for which Calcutta Medical College was famous.

Dr. A. M. O. Ghani

Dr. J. L. Bhanu

Dr. J. L. Bhanu

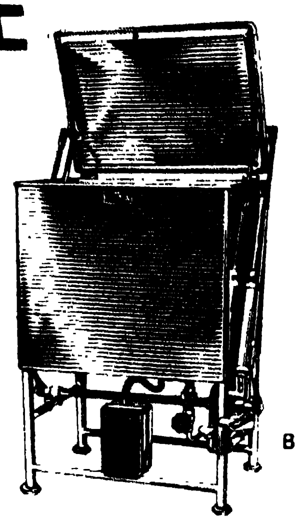
Born in 1919, Dr. Jacob Lionel Bhanu passed his intermediate examination from the St. Joseph's College, Trichy and qualified himself as an L.C.P.S. from the Miraj Medical College, Maharashtra. He served the Victoria Hospital at Manappadu in Tamil Nadu for two years. During the second World War, he joined the army medical service and on his release joined the Lake Medical College, Calcutta, wherefrom he took his M.B.B.S. degree in 1950.

After a brief period of private practice at Punalur in Kerala, followed by a period of service under the South Travancore Medical Mission, he went to the U.K. for higher studies and qualified for the D.T.M. & H. Coming back he joined as physician and superintendent of L.M.S. Boy's Brigade Hospital at Kundara (Kerala), a post he held till his end.

Dr. Bhanu came to be connected with I.M.A. at first as a member of the I.M.A., Quilon Branch. Later, he became a member of the Pattanopuram Branch and was finally associated with Punalur Branch.

He passed away on 25-8-1973 following a scooter accident in which he was involved. He is survived by his old mother, wife, two sons and two daughters.

NAT STEEL IN SERVICE OF MEDICINE First in the field, still leading



Bowl Sterilizer

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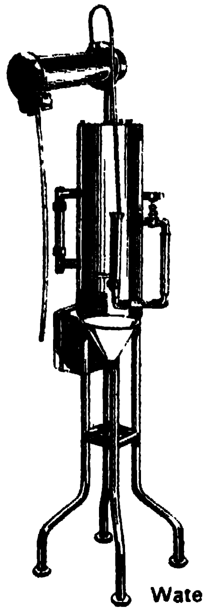

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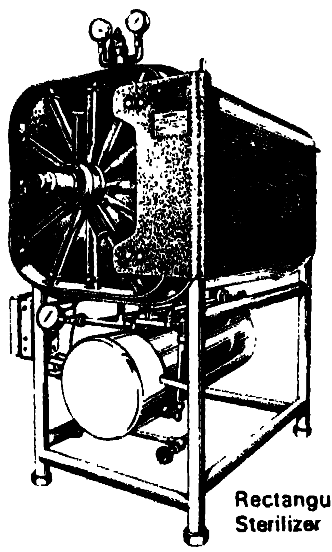

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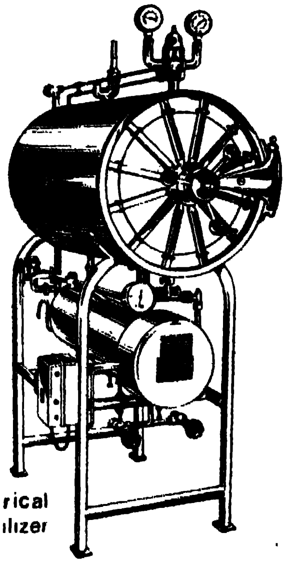

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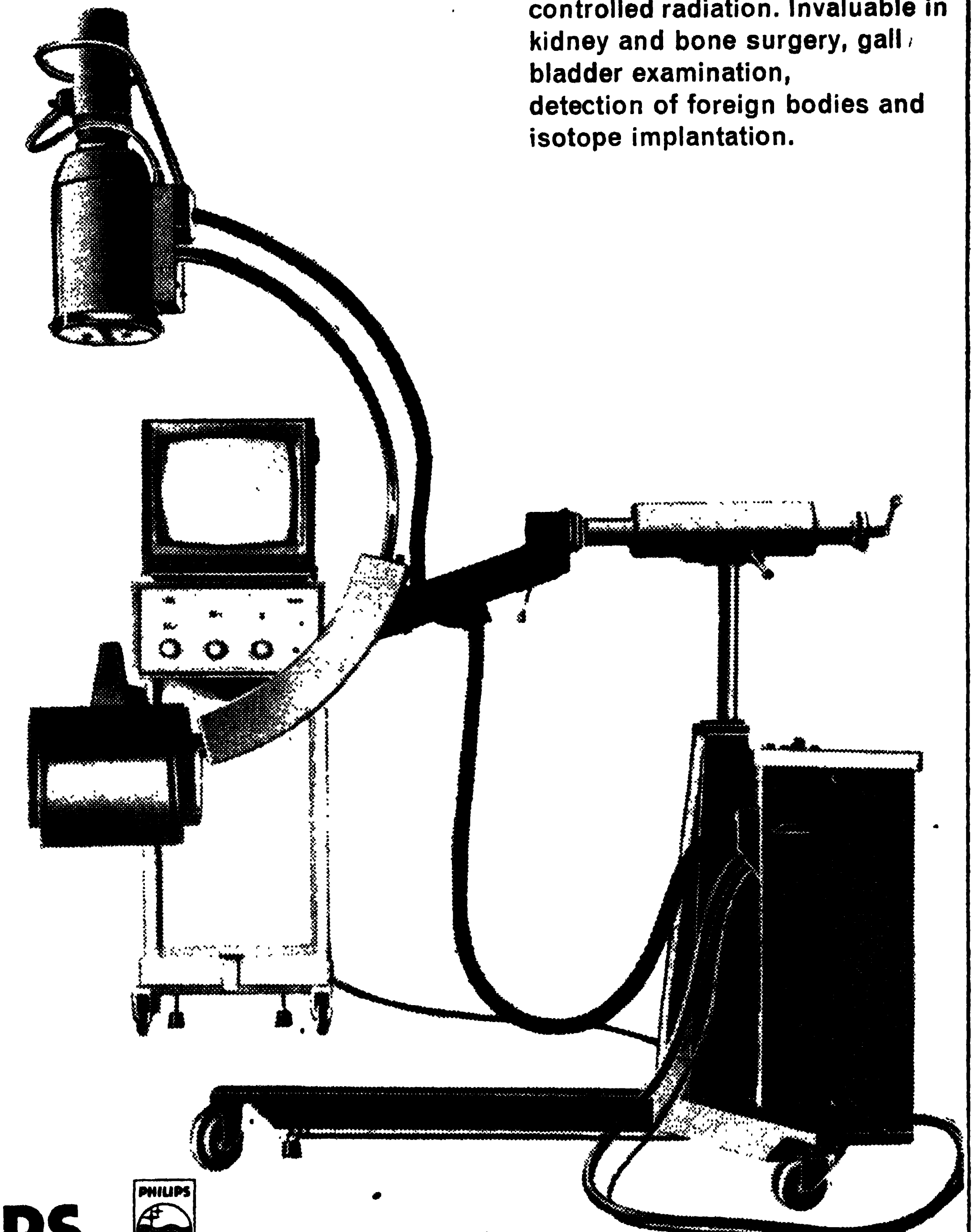

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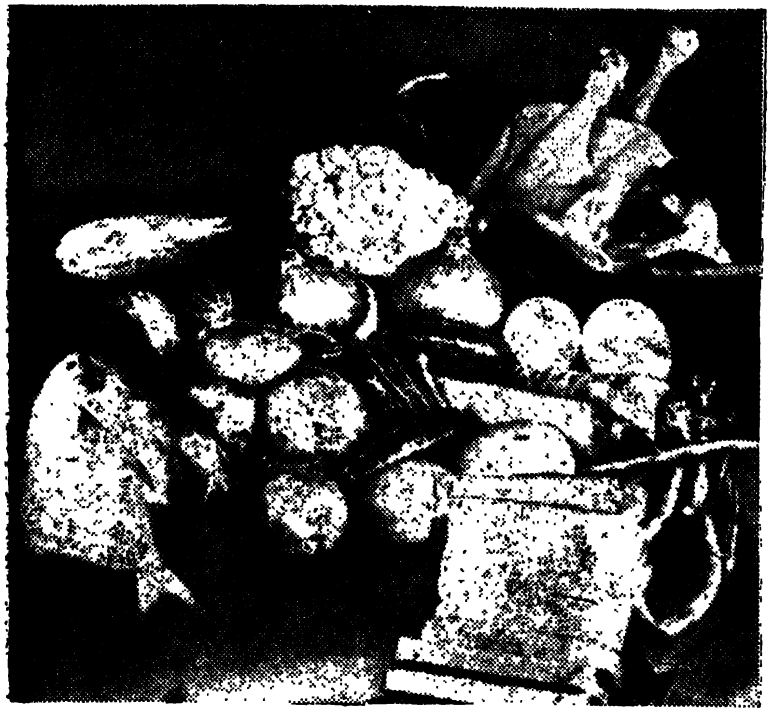

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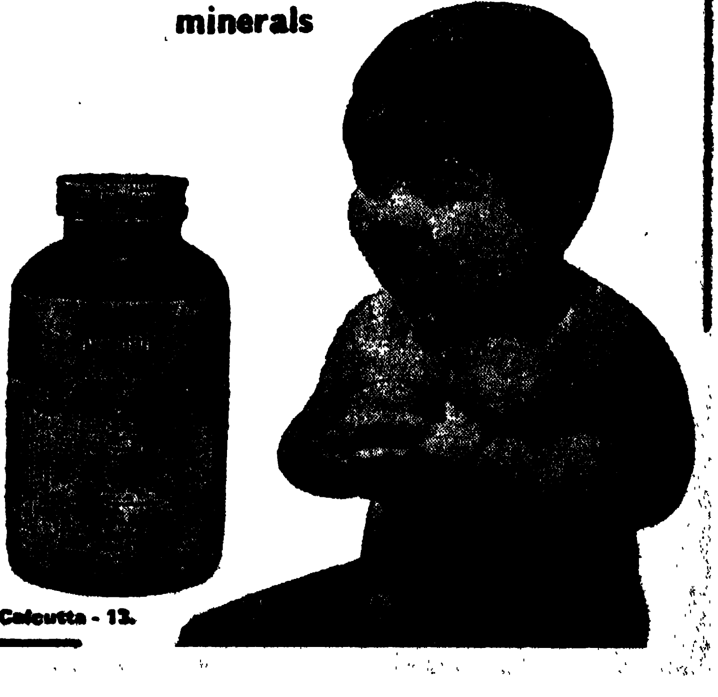

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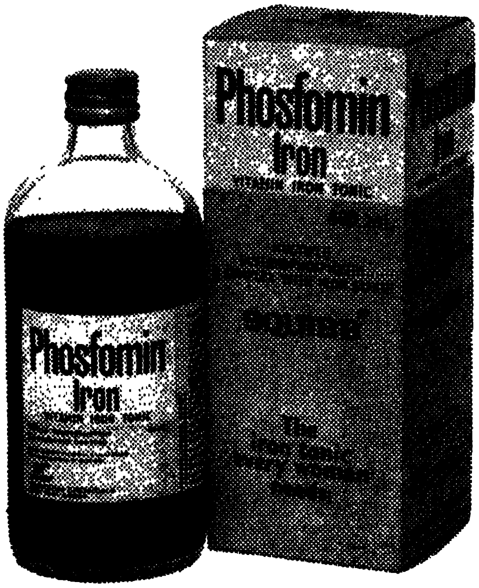

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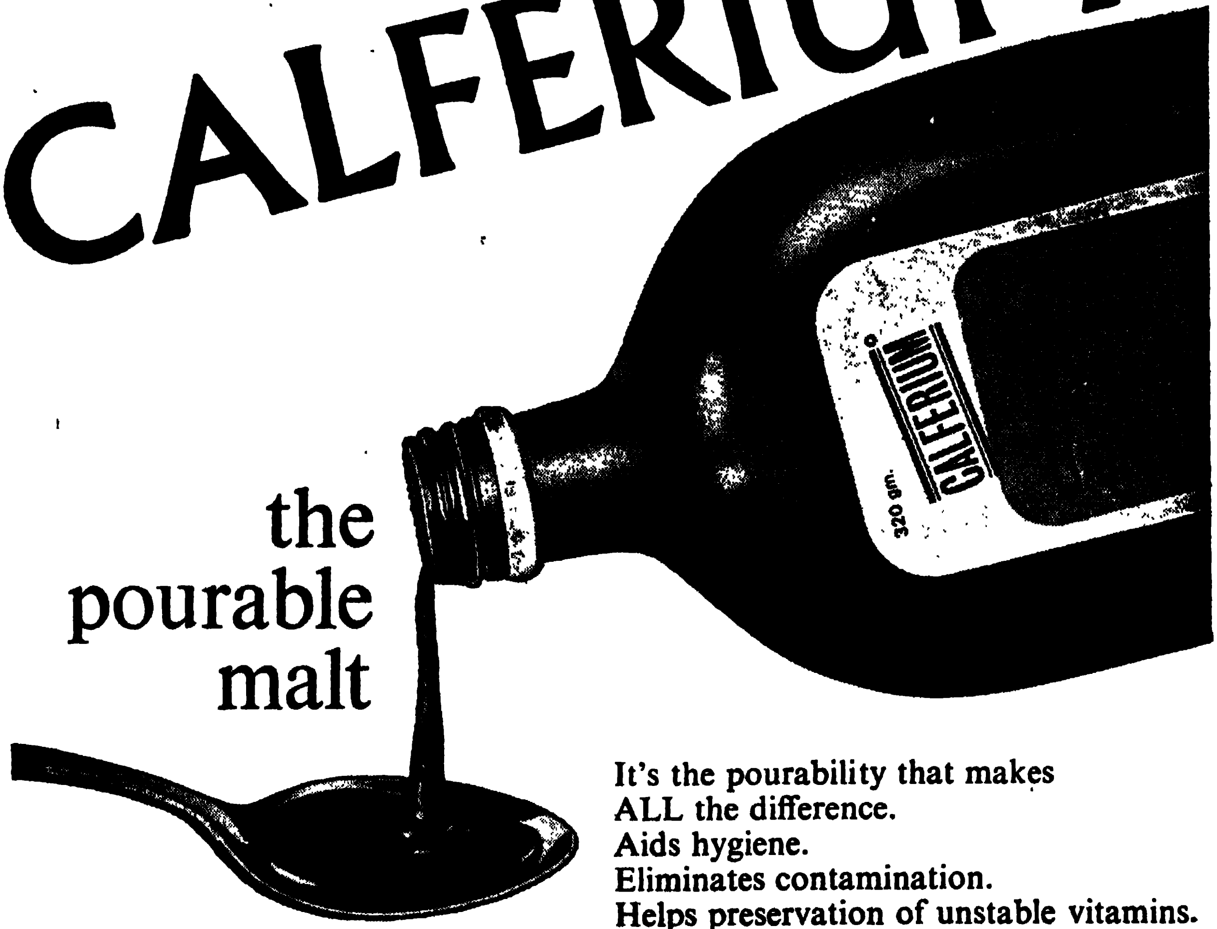

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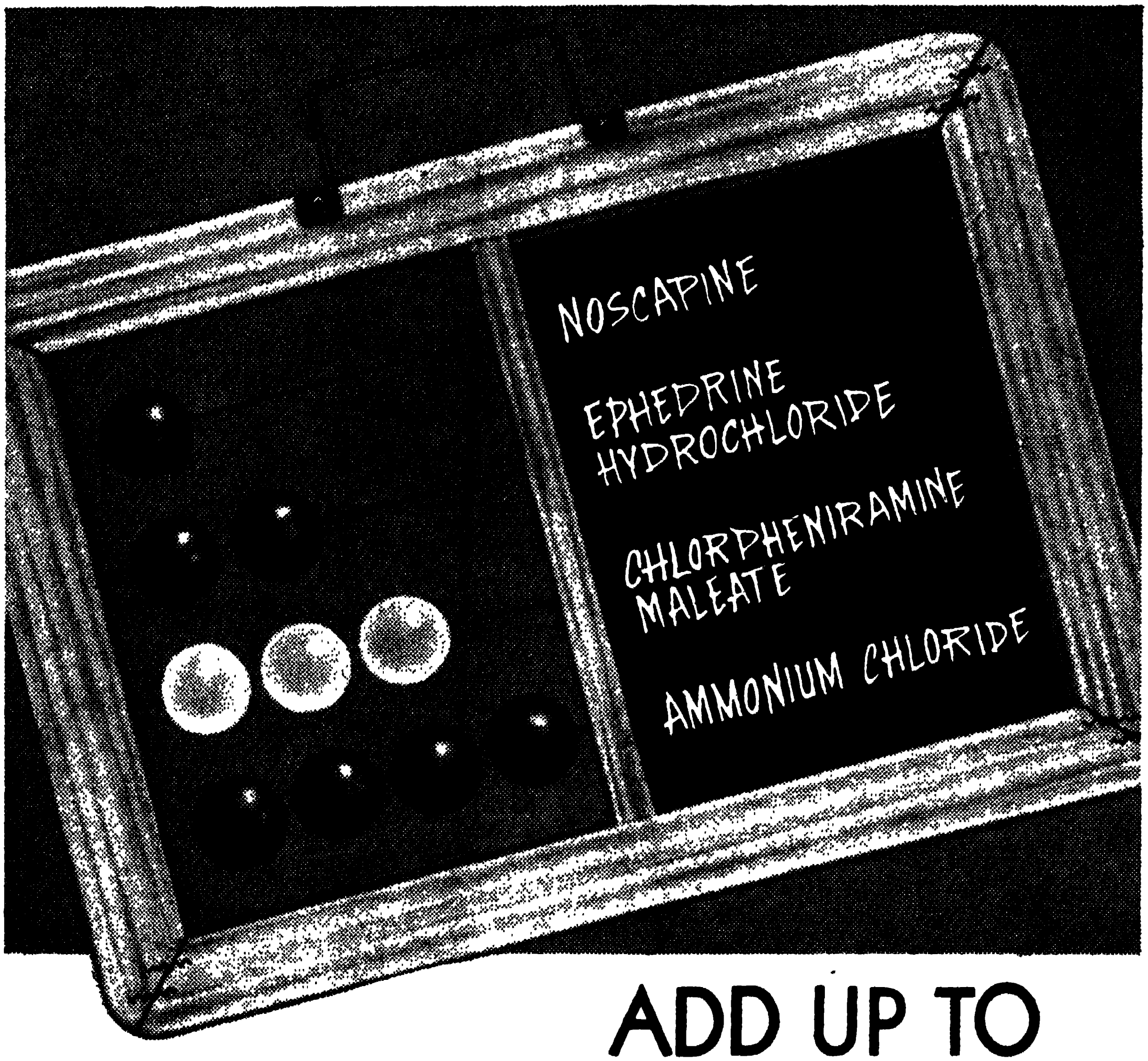

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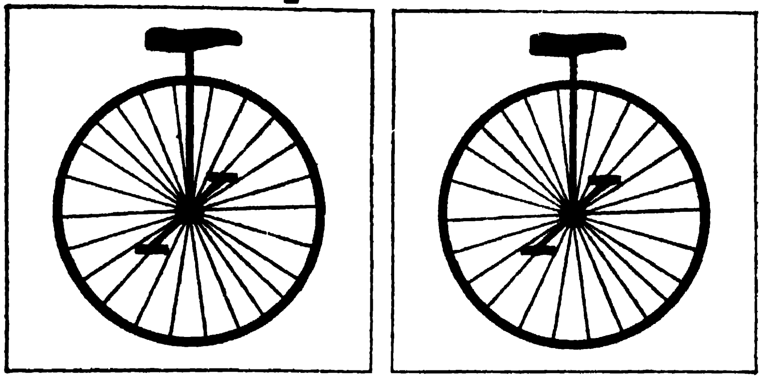

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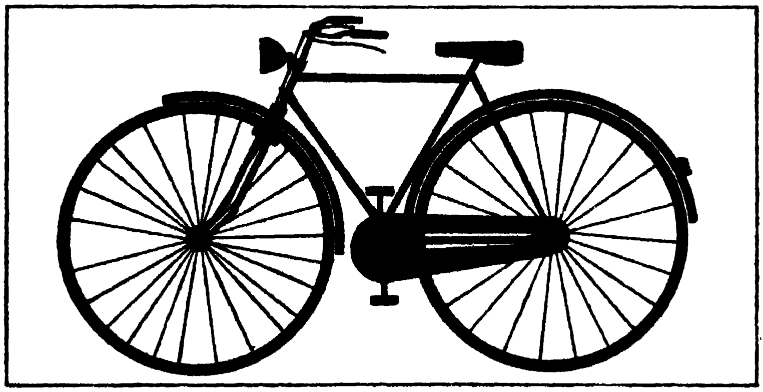

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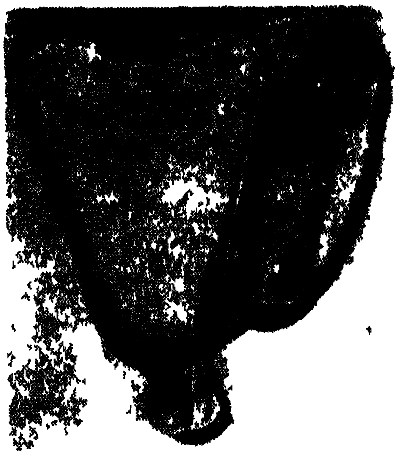

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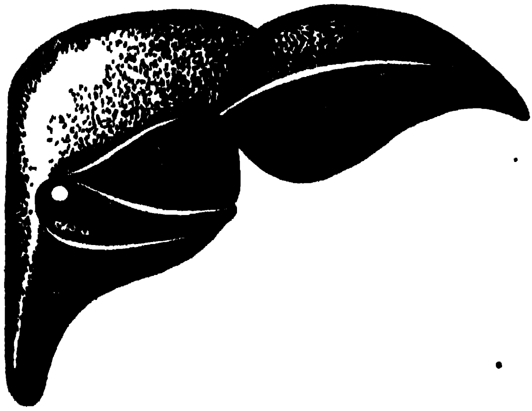

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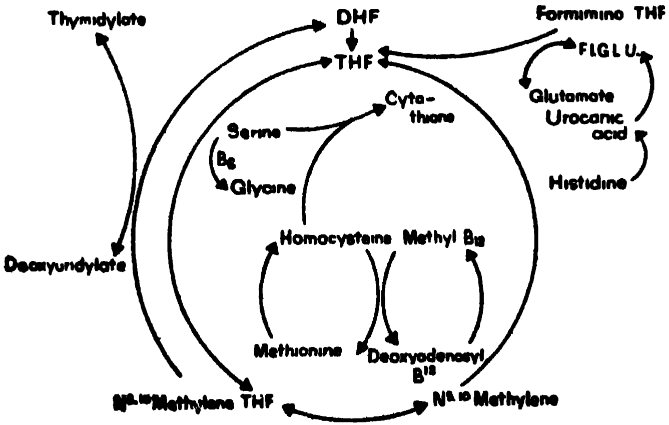
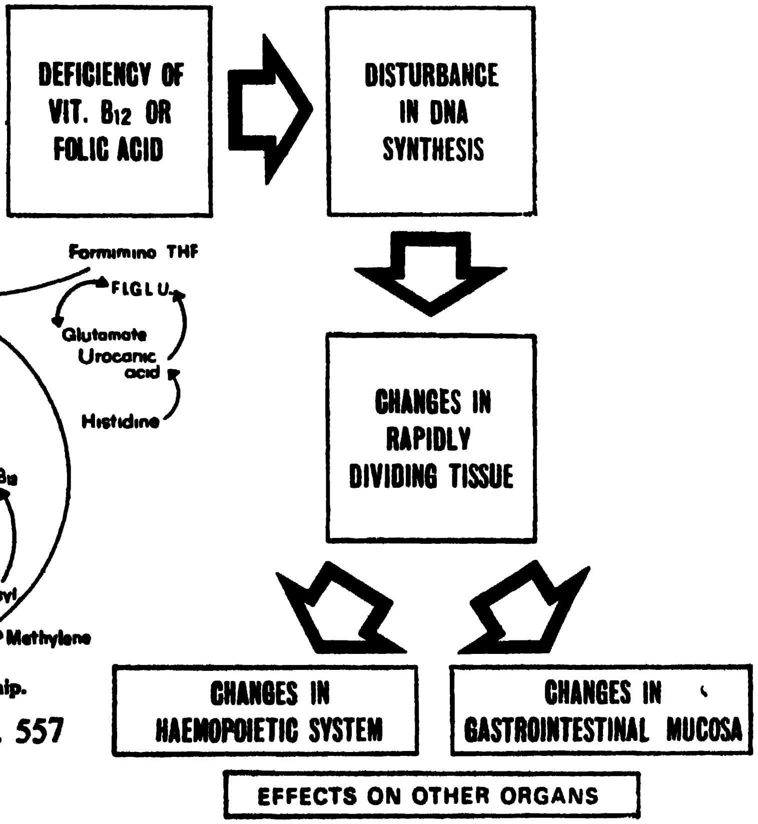


FIG. 2—B_{12}—Folate interrelationship.

B. M. J. 26 Feb. 72, P. 557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A review of the pathological reports of the needle biopsy of patients of Group IA and II further improves the success rate to 80 per cent (20 out of 25 cases were successful).

An examination of the results of needle biopsy of the lymph nodes of the left cervical region only revealed that 22 out of 25 biopsies were successful (88 per cent success).

There was no significant complication. We had not encountered any case in which there was evidence of tumour dissemination, sinus formation or reactivation of tuberculous foci.

DISCUSSION

The popularity of needle biopsy as an adjunct to diagnosis has steadily increased over the years and the procedure has been applied to many organs including thyroid, salivary glands and pleura with great success.

Needle biopsy has advocates and detractors but the general consensus of opinion is that needle biopsy is a safe, simple, reliable, inexpensive and expeditious diagnostic procedure which can be used routinely and the complications are not of that magnitude and frequency to outweigh the rewards of the method. Undoubtedly the needle biopsy has extended the range and accuracy of medical diagnosis and have made it possible to predict the prognosis with greater accuracy.

Katz (1962) advocated a specific diagnosis by needle biopsy and then refer the patient to appropriate clinic for advanced therapy and this he claimed would reduce the load on primary hospitals especially in developing countries.

The results of needle biopsy of lymph nodes performed by various authors using different types of needles are depicted in Table 3.

A few authors like Bailey and Love (1971) have reservations for needle biopsy even in most easily accessible parts of the body like the breast on the ground of fear of disseminating the tumour; and the needle missing a neoplastic area altogether.

Disadvantages The only disadvantage of needle biopsy is the possibility of the absolute and partial failures when the needle biopsy/excision biopsy may have to be repeated. The surgeon reserves the right to perform needle biopsy only if there is a promise of success. Moreover in our country due to various socio economic factors the patients consult the clinician at a much later stage of the disease. No wonder, the lymph nodes of most of the patients are "sufficiently enlarged" for successful needle biopsy. Approximately, more than 75 per cent of the patients having lymphadenopathy can be subjected to needle biopsy with optimism. Under these circumstances failure should occur only in a minority of patients.

The biopsy needle The biopsy needle should be simple, safe and successful. Vim Silverman himself admits that his needle may fail 1 in 10 cases and had to make some modifications in it following criticisms.

We tried to modify the Vim Silverman needle and made it more suitable for lymph node biopsy. The diameter of the outer tube was also increased from 2 to 3 mm with inevitable increase in the size of the cutting prong. We are fully convinced, after repeated use of this instrument, that such a large bored needle will not endanger the great vessels and nerves of the neck nor increase the complications provided it is handled with the usual precautions.

Advantages The lymph nodes are the most easily accessible and superficial structures, perhaps next only to the liver and breast lumps The unique features of needle biopsy of lymph nodes are · 1) The lymph nodes are small, slippery and hence have to be fixed with the help of one hand so that, unlike needle biopsy of the liver or any other organ, only one hand is available for the rapid manual dexterity.

Table 3- *Showing A Comparative Study of the Results of Needle Biopsy of Lymph Nodes*

Author's name	Needle used	Total No of cases	Success (%)	Partial failures (%)	Absolute failures (%)
Katz (1962)	Vim Silverman	13	11 (84.61)	—	2 (15.38)
Davies and Sessions (1967)	do	69*	56 (81.15)	—	13 (18.84)
Bhandari and Jain (1970)	Menghini Needle	125	113 (84..32)	9 (6.71)	12 (9.00)
Present study (1970-71)	Vim Silverman	50	36 (72)	5 (10)	9 (18)

*Included salivary glands and thyroid

2) The caseating lymph nodes do not offer much resistance, at least a uniform resistance to the explorer is lacking. The resistance offered by the tumours of lymph nodes is greater and the success rate also has a parallel to their high resistance.

In small lymph nodes the needle may pass through the whole of the lymph nodes and even much outside it bringing with it more of the unwanted tissue rather than the lymph node substance.

Katz (*loc. cit.*) recommends other forms of biopsy in lumps lesser than half an inch in diameter, and for lumps smaller than this it is impossible to assess whether the mass or the surrounding tissue has been biopsied.

The frequency of accurate target tissue localisation and ultimate success rate in needle biopsy may not correspond with each other. The stage of evolution of the disease (with which the size, tissue resistance and consistency of the lymph nodes get altered) determines the ultimate success to a great extent. The other factors which favour successful needle biopsy are the experience of a surgeon, fresh needles, fixity and easy accessibility of lymph nodes and co-operation of the patient.

The outcome—72 per cent success without any significant complication is certainly encouraging. The results of needle biopsy of Group II patients who underwent needle biopsy alone prove and improve the value and reliability of needle biopsy as the results were better in Group II compared to those of Group I.

The results of needle biopsy in tumours of lymph nodes were excellent. Out of 13 needle biopsies performed on patients with tumours of lymph nodes 11 were successful giving a success rate of 85 per cent. However, it must be clearly mentioned here that in almost all cases of lymphomas the pathologist was reluctant to give the final opinion without comparing the needle biopsy specimen with that of excision biopsy. One false negative report ("chronic lymphadenitis") of a needle biopsy specimen had to be corrected as 'lymphoblastic lymphoma' following simultaneous scrutiny of both biopsy specimens and both were declared to have an identical histopathological appearance. There was no false positive report.

Size variation—The average 'diameter' of the lymph nodes involved in tumours was greater than those of T. B. lymphadenitis. Their larger size and hard consistency were the main contributory factors for the uniform success rate in needle biopsy of neoplastic lymph nodes.

Table 4—*Showing T. B. Lymphadenitis: Size Variation of Lymph Nodes in Relation to Results Obtained*

Size	1 cm.	1-1.5 cm.	1.5-2 cm.	2-2.5 cm.	More than 2.5 cm.
Total No. of cases	9	15	4	8	1
Success	4	13	3	5	—
Partial failures	—	2	—	1	1
Absolute failue	5	0	1	2	—

15 out of 37 lymph nodes were of the size between 1 and 1 5 cm. (Table 4) and in this group good results were obtained (13 success and 2 partial failures). Diameters of the lymph nodes ranging from 1 to 2 cm. were best suited for needle biopsy of lymph nodes though the size alone does not determine the end results. The lymph nodes smaller than 1 cm. and lymph nodes larger than 2 cm. are not very suitable for needle biopsy of lymph nodes for the chances of success are less due to frequent inaccurate target tissue localisation and caseation respectively.

Reporting Needle biopsy is equally a challenge to the professional skill and competence of both the pathologist and the surgeon. In cases of Hodgkin's disease, the tissue piece obtained by needle biopsy being tiny, the Dorothy Reed giant cells may be scanty or absent and the pathologist may defer a final opinion till he can compare it with that of an excision biopsy specimen. But even in a tiny piece of lymph node one can definitely suspect and give enough indication to put the surgeon on the alert that the pathological process may be that of a lymphoma.

Needle biopsy undoubtedly limits the curiosity and ability of the pathologist in subclassifying the type of lymphoma satisfactorily as this requires examination of the entire lymph node. In cases of primary tumours of lymph nodes where the capsule and lymph node's architecture cannot be demonstrated even in excision biopsy, the tissue identification is often justified by exclusion.

Failures—In spite of accurate target tissue localisation in 86 per cent of the cases we obtained only 72 per cent success in this series. The failure were mainly in cases of T. B. lymphadenitis, that too often due to overwhelming caseation process, a point unique with T. B. lymphadenitis. The tissue removed by needle biopsy was inadequate for block making in two cases.

The partial failures usually result from natural course of the disease (mainly caseation) and hence they are unavoidable. Histologically, only 3 out of 37 biopsy specimens did not show caseation necrosis. If, in course of time, we succeed in identifying the caseous material unmistakably by a special stain, that should be (histopathologically) diagnostic for tuberculosis.

In our experience, once the lymph nodes are visibly enlarged the pathological process is advanced extensively enough to grant us a representative specimen on needle exploration. Thus, the failure to get a representative specimen of diseased lymph node on needle exploration can seldom be attributed as a cause of failure.

Limitations and scope—Knowledge regarding the stagewise evolution of lymphomas and histopathology of the diseased lymph node 'in retrospect' may be obtained by repeated needle biopsy and/or needle aspiration biopsy of the same diseased lymph node and the apparently unaffected adjacent and remote lymph nodes of different anatomical regions. Such a study should throw further light upon the aetiopathology of lymphomas. The inguinal lymph nodes are palpable in normal individuals and are of adequate size for such a study.

The advantage of needle biopsy is that it can replace excision biopsy in not less than 75 per cent of cases of lymphadenopathy. The limitation of needle biopsy is that it cannot replace the excision biopsy in all cases. We suggest that the needle biopsy may be used for screening suitable cases of lymphadenopathy, the excision biopsy being reserved for a minority of cases in whom results of needle biopsy are inconclusive.

The success rate of needle biopsy should further improve along with surgeon's experience and evolution of biopsy needles and procedures.

SUMMARY

Needle biopsy of lymph nodes (using Vim Silverman needle) performed on 50 patients of lymphadenopathy was rewarded with success in 36 cases. It is concluded that needle biopsy is a dependable diagnostic procedure which can be routinely tried. Initially, it may precede the excision biopsy procedure with ultimate replacement of excision biopsy by the needle biopsy as the surgeon gains experience.

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CASE NOTES

1

Ortner's Syndrome

N. G. K. SHARMA*, C. P. KAPOOR**
(MISS) LATA MAHAMBRE***
M. P. BORKAR****

Hoarseness of the voice due to left recurrent laryngeal nerve paralysis is a rare complication of mitral stenosis. Wood (1956) in his series observed this complication in about 0.5 per cent of cases of mitral stenosis. Banerjea (1959) reported one case in a series of 88 cases and Nag (1959) found four cases in a study of 500 cases, of mitral stenosis. Pai *et al.* (1966) reported two cases and Vigg *et al.* (1970) reported three cases. We had the opportunity of studying a case of Ortner's syndrome. The case is reported because of its rarity.

CASE REPORT

Mrs. A. D., a 50-year-old housewife was admitted in the Panjim Hospital on 29-9-1971 with the history of hoarseness of voice of three months' duration. Initially, she thought this to be due to sore throat and consulted a private practitioner. As the hoarseness did not improve, she was referred to the hospital. She did not complain of cough or pain in the throat. On asking, she gave the history of progressive exertional dyspnoea of 20 years' duration which was of Grade II at the time of admission. She also complained of palpitations on exertion but did not complain of paroxysmal nocturnal dyspnoea or oedema feet. She used to get repeated episodes of arthralgia involving the bigger joints but without fever or swelling of the joints during the past 20 years.

Physical examination revealed a middle aged lady, not obviously dyspnoeic. Her voice was husky. She was anaemic. The jugular venous pressure was normal. There was, no clubbing of the fingers. There

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was no oedema. The pulse rate was 84/minute, regular in rhythm and of normal volume. The blood presure was 130/94 mm. of Hg. There was no precordial bulge. The apex was felt in the fifth left intercostal space, 1 cm. lateral to the mid-clavicular line. There was a diastolic thrill at the apex. Parasternal heave was present. The pulmonary second sound was palpable. The right border of the heart was 2 cm. outside the lateral sternal line in the third and the fourth spaces. The second left intercostal space was dull to percussion The mitral first sound was accentuated. A prolonged mid-diastolic rumble with presystolic accentuation was heard in the mitral area. There was an opening snap which could be heard just medial to the mitral area The pulmonary second sound was loud and closely split. There was a soft systolic murmur, Grade II in the pulmonary area. Other systems were normal.

The diagnosis was rheumatic heart disease with mitral stenosis, pulmonary hypertension and Ortner's syndrome

Investigations Investigations revealed that urine and stool were normal. Haemoglobin was 8 g per cent. The white cell count was normal Electrocardiogram (Fig. 1) revealed left atrial hypertrophy. X-ray chest, postero-anterior view (Fig. 2, *vide* Plate), showed an increase in the transverse diameter of the heart with a prominent pulmonary artery segment. Barium swallow picture taken in the right anterior oblique view (Fig. 3, *vide* Plate) revealed, backward shift of the oesophagus and left atrial enlargement. Laryngoscopic examination revealed paralysis of the vocal cord.

DISCUSSION

Our case had all the classical signs of mitral stenosis and pulmonary hypertension. There were also radiological and electrocardiographic evidences of dilatation of the left atrium and the pulmonary artery. An E.N.T. check up confirmed the paralysis of the left vocal cord and ruled out any of the other common causes of hoarseness of the voice.

The exact mechanism of the paralysis of the left recurrent laryngeal nerve in mitral stenosis is not clear. Ortner (1897) who was the first to describe this condition thought that the nerve was compressed by the dilated left atrium. But his view was not accepted by the later workers. Fetterolf and Noris (1911) were of the view that the left recurrent laryngeal nerve is compressed between the dilated left pulmonary artery and the aorta or aortic ligament. Dolowitz and Lewis (1948) thought that the actual compression is usually mediated by the enlarged tracheobronchial lymph nodes. Stocker and Enterline (1958) thought that in addition to upward displacement of the pulmonary artery in mitral stenosis there are other ancilliary factors, like the site of attachment of ligamentum arteriosum, lymphadenopathy in the aortic window and stretching of the nerve after fixation at the aortic window, which are responsible for the compression of the left recurrent laryngeal nerve. Ari *et al.* (1955) reported that the voice may improve after surgical correction of the mitral stenosis.

The interesting feature in our case was that the patient presented for the first time with this rare complication of mitral stenosis

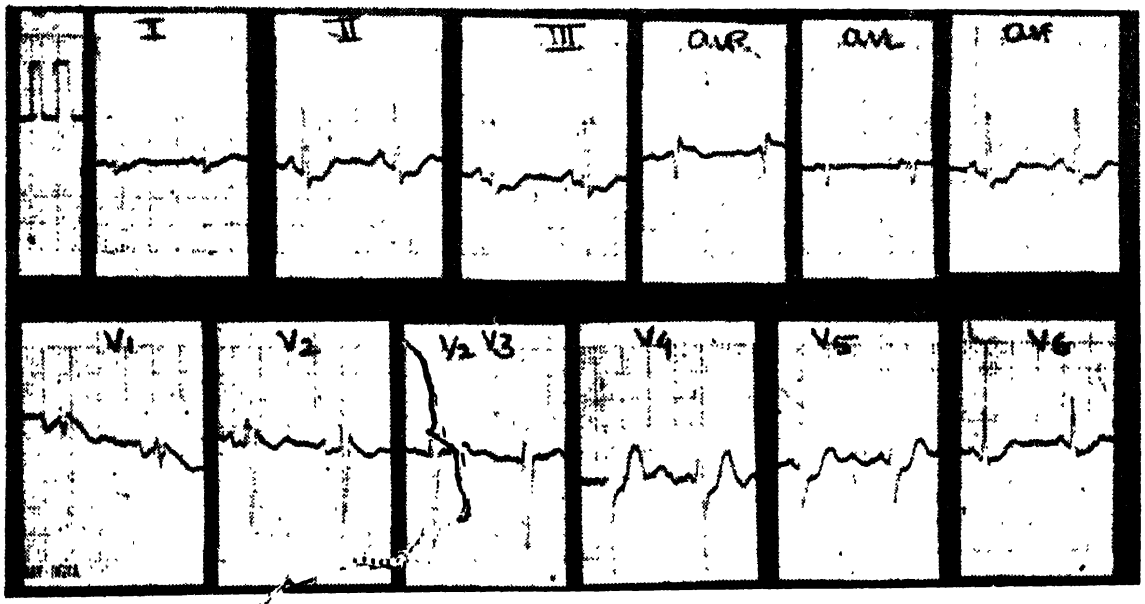


Fig. 1 -E.C.G. Showing Left Atrial Hypertrophy

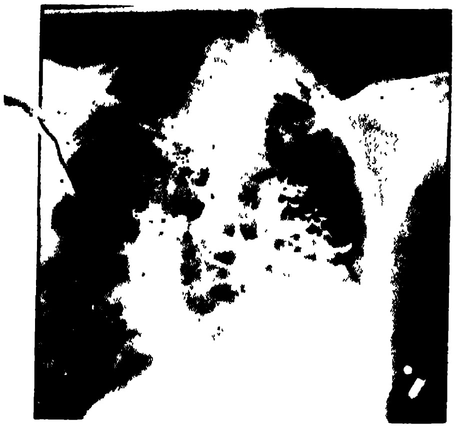


Fig. 1

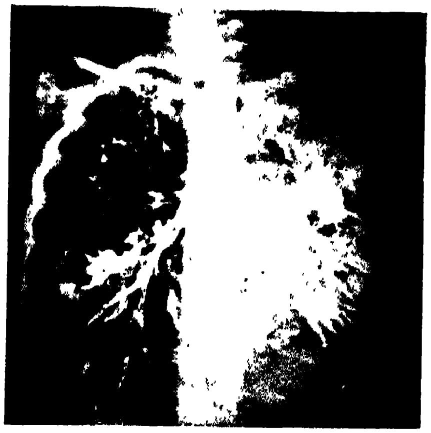


Fig. 2

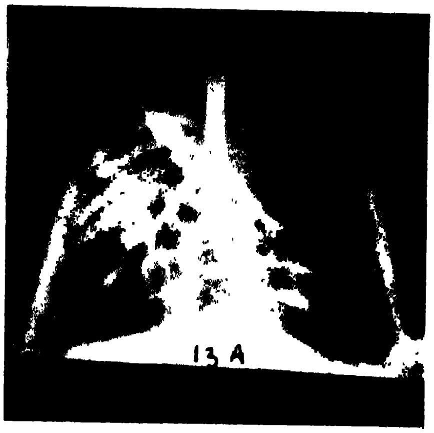


Fig. 3

Charan and Sinha—Clinical Pattern and Role of Surgery in Bronchiectasis (p. 412)

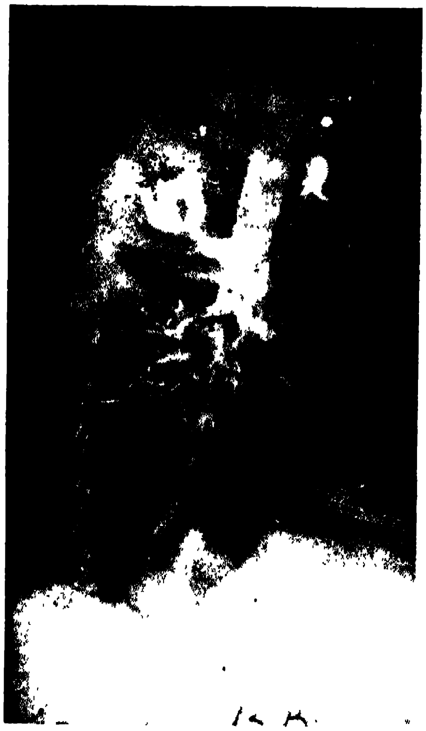
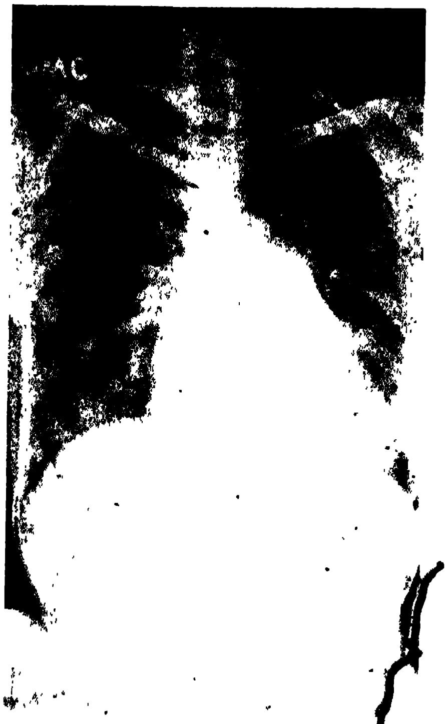


Fig. 4

Charan and Sinha—Clinical Pattern and Role of Surgery in Bronchiectasis (p. 412)



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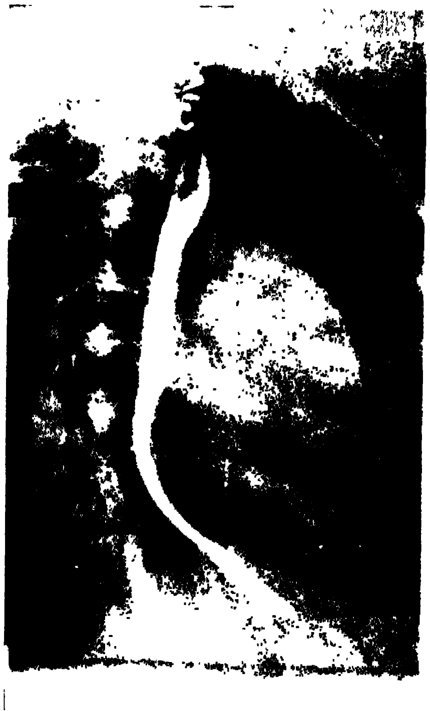
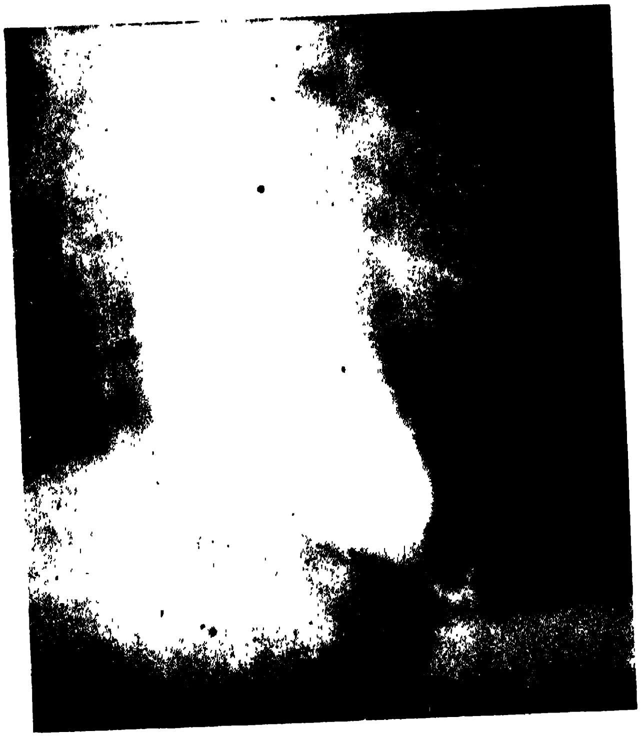


Fig. 3

Sharma et al.—Ortner's Syndrome (p. 427)



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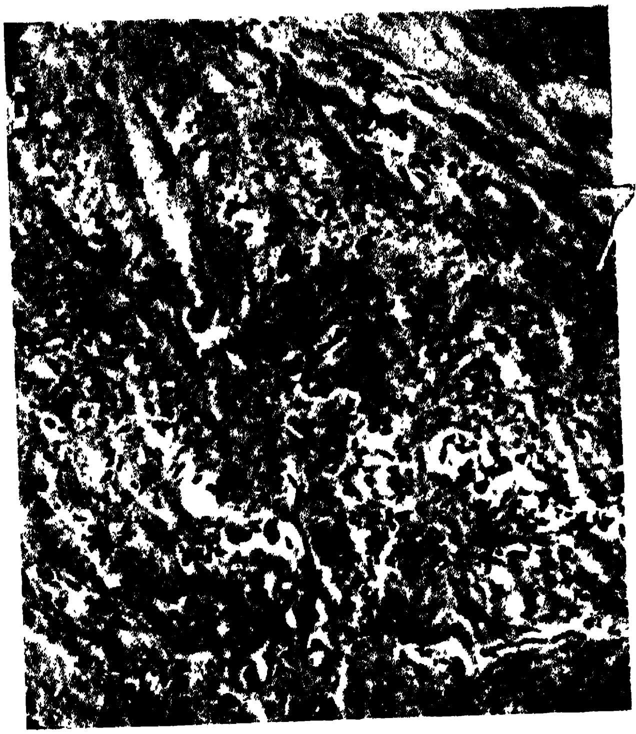

Fig. 2

Ullal and Rao—Achalasia : An Unusual Manifestation of Carcinoma of the Cardia (p. 431)

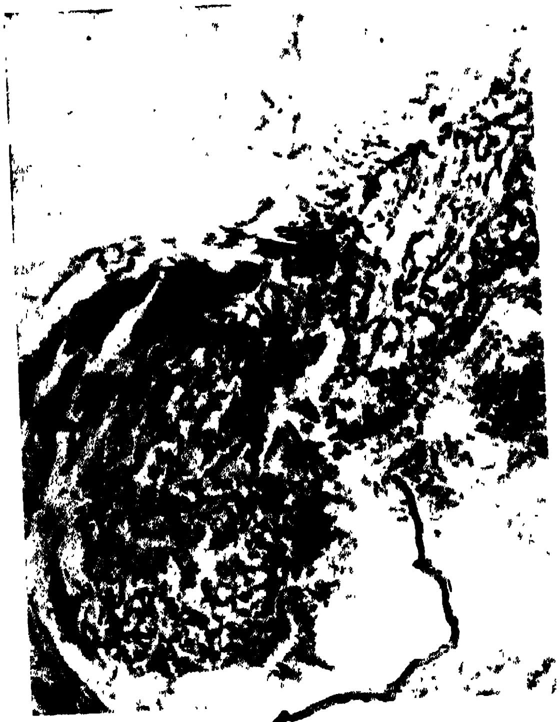

Fig. 3

Ullal and Rao—Achalasia : An Unusual Manifestation of Carcinoma of the Cardia (p. 431)

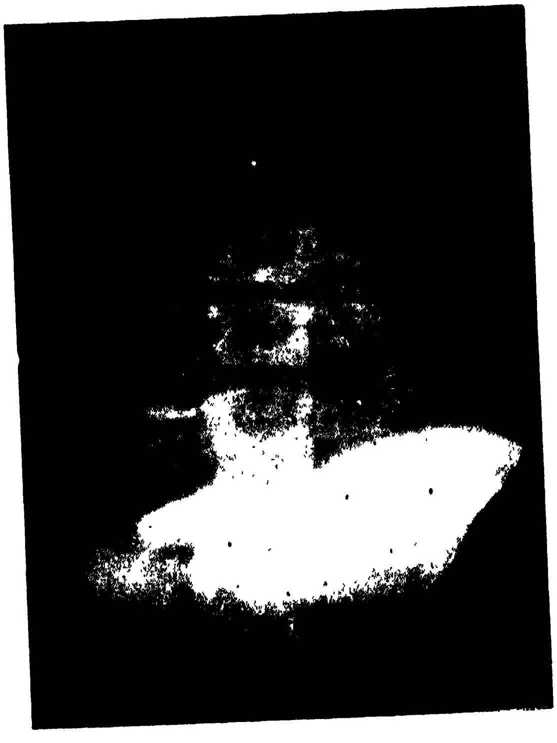

Fig. 1

Dutta and Deb Roy—Tuberculosis of Duodenojejunal Flexure Presenting as Pyloric Stenosis (p. 432)

SUMMARY

A case of hoarseness of voice as a result of left recurrent laryngeal nerve paralysis in mitral stenosis is reported. The patient had pulmonary hypertension with left atrial and pulmonary artery dilatation.

ACKNOWLEDGMENT

We are thankful to Dr. R. K. Sanyal, Dean, Goa Medical College, Panaji, Goa for permitting us to report this case.

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2

Achalasia

An Unusual Manifestation of Carcinoma of the Cardia

S. R. ULLAL*, N. R. RAO**

Intermittent or transient cardiospasm may be an initial and only manifestation of carcinoma of the cardiac end of the stomach (Asherson, 1953). This form of presentation of carcinoma of the cardia has received little recognition. This report describes a patient with adenocarcinoma of the cardia but whose presenting features were those of achalasia

CASE REPORT

M.R., a 32-year-old Indian male, was referred by his general practitioner to Kasturba Hospital, Manipal in April 1969 for investigation of dysphagia of one and a half year's duration. It had begun with a feeling of solid food sticking in his chest intermittently and needing sips of water to wash it down. About a year later he noticed the same difficulty with liquids. Belching after eating was common. There was no vomiting, no pain, no respiratory symptoms, no appreciable loss in weight and no voice changes. Appetite was not affected and the dysphagia was intermittent.

On examination he was found to be a short man, looking fairly fit. There was no evidence of anaemia or clubbing. Abdominal and chest examination revealed nothing abnormal. No lymph nodes were palpable in the neck. Blood pressure was 130/90 mm.Hg.

Investigations- Haemoglobin was 13.5 g. per cent and the leucocyte, total and differential counts were within normal limits. Chest radiograph was normal.

Barium swallow screening showed a dilated oesophagus with a smooth persistent stricture at and just below the diaphragm (Fig. 1, *vide* Plate). Barium was seen to flow into the stomach slowly. There was no evidence of a hiatus hernia and examination with the patient in Trendelenburg's position showed nothing abnormal in the region of the cardia.

Oesophagoscopy confirmed the presence of a dilated oesophagus with frothy food residue. A smooth stricture was seen at 35 cm. from the upper incisor teeth, but the oesophagoscope could not be passed through the area. A gum elastic bougie was able to negotiate the stricture site and passed into the stomach without producing bleeding. The mucous membrane was intact and since the investigations appeared to confirm the diagnosis of achalasia, a biopsy was not done.

Surgery- It was proposed to perform a Heller's operation through a thoracic approach. On opening the chest through the bed of the left eighth rib, the lower inch of the oesophagus was felt to be hard and rigid. The diaphragm was opened and the stomach palpated. This showed a firm thickening of the cardia with enlarged and hard lymph nodes along the lesser curvature and left gastric pedicle. There were no hepatic or peritoneal deposits. An upper radical gastrectomy was performed along with resection of the lower oesophagus and an oesophago-gastrostomy was fashioned just below the arch of the aorta. The postoperative period was uneventful and the patient went home after three weeks.

The resected specimen showed that the wall of the lower 3 cm. of the oesophagus and the adjacent part of the cardia were very firm to the touch. A cut section revealed that the wall of the oesophagus and cardia was thickened and greyish white in colour. The overlying mucosa had several minute ulcerations. The lumen of the oesophagus was grossly reduced over this area.

Histology—Microscopically, the wall of the oeso-

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phagus and stomach showed diffuse infiltration of the muscular layers by cells with large hyperchromatic nuclei (Fig. 2, H. & E. × 100, *vide* Plate). These cells were also seen surrounding and infiltrating the nerve twigs in the muscle layers (Fig. 3, H. & E. × 100, *vide* Plate). Ganglion cells were not visualised in the sections. The appearances suggested a diagnosis of adenocarcinoma of the cardia infiltrating the oesophageal wall and also involving the nerve twigs therein. The lymph nodes along the lesser curvature showed deposits of adenocarcinomatous cells.

The patient was re-admitted three months later with symptoms of subacute obstructions. On examination he had ascites and an enlarged nodular liver. He deteriorated rapidly and died three weeks later.

DISCUSSION

The diagnosis of the carcinoma at the cardiac end of the stomach is rarely straightforward. It is a difficult type of growth to visualise radiographically and many a time an apparently normal picture may be seen on barium study. In a review of 405 cases of carcinoma of the thoracic oesophagus and cardia, Miller (1962) found that the diagnosis of carcinoma of the cardia was difficult as the history was usually atypical and barium studies were often inconclusive.

That achalasia may be an initial manifestation of carcinoma of the cardia has received little recognition, though it is well known that the latter condition may be mistaken for the former in cases where there is some degree of dilatation of the oesophagus. There appear to be only two reported cases so far of this mode of presentation of carcinoma of the cardia. In a series of seven patients with carcinoma of the cardia, Park (1952) had a 34-year-old female with dysphagia of three months' duration and whose barium studies showed typical features of achalasia. Oesophagoscopy did not reveal anything abnormal and it was only at laparotomy that the carcinoma of the cardia was detected. Asherson (*loc. cit.*) reported a male patient with a two-year history of intermittent dysphagia, which was diagnosed as achalasia after barium studies and oesophagoscopy. It was proposed to perform a Heller's operation, but laparotomy revealed a carcinoma of the cardia with involved lymph nodes along the lesser curvature and metastatic nodules in the pelvis.

The aetiology of achalasia in these cases has not been clear. Asherson (*loc. cit.*) felt that it was due to reflex nerve irritation caused by the growth at the cardia. It is known that in pathological conditions the normal action of the physiological lower oesophageal sphincter may be interfered with, causing a functional obstruction of the nature of achalasia (Chesterman, 1965). In the case described in this report, malignant cells were seen to be infiltrating the lower oesophageal muscle as well as the neural elements. The oesophagus, unlike the duodenum, offers no resistance to the spread of carcinoma from the cardia and fundus of the stomach. Dodge (1961) found that in a series of 53 resected adenocarcinomas of the cardia, 58.5 per cent had invaded the oesophagus. However none of these are reported to have shown infiltration of nerve twigs in the oesophageal wall. It is quite likely that such a spread and involvement of the lower oesophageal muscle fibres as well as the neural elements by malignant cells could interfere with the sphincteric mechanism of the lower end of the oesophagus and produce an obstructive picture of the nature of achalasia.

A dilated oesophagus in association with dysphagia does not necessarily mean achalasia. The possibility of carcinoma of the cardia should be kept in mind in all such patients, irrespective of their age. It is worthwhile repeating the warning given by Sir Heneage Ogilvie (1947) that "a diagnosis of cardiospasm should never be made in an adult with a short history until the possibility of a high gastric cancer has been excluded."

SUMMARY

A case of carcinoma of the cardia presenting with features of achalasia is described. The correct diagnosis was made only at operation. Microscopic study of the resected tissue showed infiltration of the oesophageal muscle fibres as well as neural elements by malignant cells. The infiltration of the nerve twigs by the malignant cells is considered to have interfered with the lower oesophageal sphincteric mechanism and produced the clinical picture of achalasia.

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3

Tuberculosis of Duodenojejunal Flexure Presenting as Pyloric Stenosis

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The mortality and morbidity of gastro-intestinal tuberculosis in India is still high. Diagnosis and treatment of this fell disease continue to remain a challenge to physicians and surgeons alike in spite

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of great advancement made in prophylaxis and treatment of the condition in general. Of the bowels, ileocaecal region has been mostly affected. But recently it has been shown (Bhansali and Desai, 1968) that the small bowel is involved more than the large bowel (including the ileocaecal region) and the ileum is involved about three times more than the jejunum. Occasional cases of tuberculosis of the stomach and duodenum have been reported but the involvement of these organs are very rare indeed.

We present here a case of tuberculosis of duodenojejunal flexure presenting as a case of pyloric stenosis.

CASE REPORT

S. D., a 7-year-old girl, presented with vomiting after taking food, loss of weight and constipation on and off for 2 years. Pain which was present only at the beginning was dull aching in nature and was located around the umbilical region. There was no radiation, no relation with food but associated with vomiting Vomiting of solid particles followed every meal. The vomitus also contained yellow coloured bile. The patient gave no history of haematemesis. Her appetite was good. She could eat but could not retain because of vomiting. Bowels were severely constipated and moved only every 3/4 days. Micturition was normal. She had fever at the beginning but subsequently had normal temperature throughout the illness. Her parents stressed that she was in perfect health till the onset of symptoms which was rather sudden.

Examination—Build was average and nutrition was poor. Dehydration and wasting were present. There was no anaemia and there was no palpable glands in the neck. The pulse, temperature and respiration were normal. There was fullness over the epigastrium with marked visible peristalsis from left to right. There was no tenderness or palpable lump. Succussion splash was present. No other abnormality was detected. P.R.—N.A.D. Heart, lungs and C.N.S.—N.A D.

The impression was that this was a case of pyloric stenosis; cause to be ascertained.

Investigations—Blood: Total W.B.C. count was 9000/c.mm. with differential counts within normal limits. E.S.R.—2 mm./1st hour, blood urea—24 mg. per cent, Hb.—65 per cent. The fractional test meal could not be done as the patient did not co-operate. Mantoux test—negative in 1 : 1000 but positive in 1 : 100, plain x-ray of abdomen showed gas shadows and fluid levels seen on the right side; barium meal x-ray showed the stomach to be fairly dilated. No filling defects or ulcer crater were seen in the stomach. The duodenal loop was hugely dilated with a gas shadow at the top of the duodenal loop.

The impression was of obstruction at the fourth part of the duodenum (Fig. 1, *vide* Plate).

In view of the x-ray finding, a distal duodenal obstruction was thought probable and the diagnosis of duodenal or jejunal stenosis, chronic duodenal ileus, ring pancreas, fibrous band pressing over the duodenum and many others were considered and entertained.

Laparotomy—On laparotomy, there was marked dilatation of the stomach; enormously dilated and distended duodenum filled the right side of the abdomen and was limited in the middle abruptly by the duodenojejunal flexure. Serosal surface of duodenojejunal flexure and adjoining portion of the jejunum was studded with white glistening multiple tubercles. The area affected, about 2 inches in length, was much thickened and the lumen appeared to be completely obliterated; lymph nodes were not enlarged. No other lesions were found. Biopsy of a serosal tubercle was taken A simple gastrojejunostomy was carried out.

Histology—Histology confirmed the diagnosis of tuberculosis. Patient was put on antituberculosis regime and she made an uneventful recovery. At the 2nd visit 6 months after the initial discharge, she was found to be much improved with increased appetite, gain in weight and there was all round improvement.

COMMENTS

Intestinal tuberculosis is a very common malady but its diagnosis is not always clear cut and often may be baffling. In general, a preceding history of intermittent abdominal pain, altered bowel habits, irregular pyrexia, anorexia, loss of weight, presence of a lump and a raised E.S.R. are all pointers to the diagnosis. Raised E.S.R. and fever are often signs of only florid state of the condition. In cases with obstruction, usually a preceding history of colicky pain is obtained over and above the other usual findings. But in cases of the upper jejunum or duodenum which are very rare sites for this infection the diagnosis of tuberculous obstruction may be very difficult. Usual abdominal findings are absent. E.S.R. may be equivocal. Ba-meal findings are not specific. One has no other alternative but to resort to exploratory laparotomy for diagnosis.

SUMMARY

A case of tuberculosis of duodenojejunal flexure with obstruction has been presented here. Because of the rarity of the site and paucity of usual abdominal findings it is felt that the pre-operative diagnosis is extremely difficult.

ACKNOWLEDGMENT

We are thankful to Dr. S. N. Sarma, Principal and Superintendent, Medical College, Gauhati, for allowing us to publish this paper from the hospital records.

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4

Neurological Complications of Typhoid Fever

K. GOPINATHAN NAIR*

Neurological complications of typhoid fever are well known. This include both general and focal complications, the former being much commoner than the latter The general manifestations described include delirium, apathy and post-typhoid insanities of many forms, the nature of which in any individual case depend upon the psychological constitution of the patient (Brain, 1969). Post-typhoid confusional states may persist for weeks or months although ultimate recovery is the rule (Price, 1966). Meningeal involvement in the form of meningism is common, while true meningitis due to *S typhi* is rare The latter is often a fatal condition Convulsions are extremely uncommon in typhoid fever (Price, *loc. cit*) The focal symptoms described include hemiplegia (Smithies, 1907), optic neuritis, cerebral abscess, acute transverse myelitis, Landry's paralysis, aphasia, and peripheral neuritis Hemiplegia, although not life threatening frequently cause permanent disability Recently, a case of acute transverse myelitis, developing in the course of enteric fever, is reported here

CASE REPORT

Male, aged 26 years, was admitted on 29-10-1971, with a history of 2 weeks continuous fever treated elsewhere with no improvement, general weakness and a dry non-productive cough. On examination, he was found to be well built, skin warm and dry, face flushed, the tongue dry and coated white There was no lymphadenopathy, no pallor or cyanosis and no clubbing of the fingers or toes. His respiratory rate was 20/minute, pulse rate 80/minute and oral temperature was 102°F. Blood pressure, on admission, was 120/80 mm. of Hg. Examination of the abdomen revealed a palpable liver, and spleen which was soft and extending 1 cm. below the costal margin. Respiratory, cardiovascular and nervous system examination were non-contributory.

Investigations--Haemoglobin—13 g. per cent, total WBC count 6000/c.mm. with polymorphs--50 per cent, eosinophils--10 per cent and lymphocytes—40 per cent. B.S.R.-- 40 mm./1 hour (Westergren). Widal test--*S. typhi* O-antigen positive—1 in 640 dilution. H-antigen positive—1 in 160 dilution *S Paratyphi A* and *B* -no significant titre. Blood culture—negative. Chest x-ray—normal.

Management and course—The patient was started on chloramphenicol 500 mg. six hourly and his temperature touched normal on the fourth day. On the sixth day the patient complained of pain in the loin and slight weakness in the left foot. By next day he developed complete paralysis of both lower limbs. There was retention of urine. Examination, at this stage, showed a complete flaccid paraplegia with absence of deep reflexes with a marked sensory deficit up to sensory level of T10. Head, neck and examination of the trunk above the level of T10 did not reveal any neurological deficit. Patient remained afebrile throughout this period. Examination of the CSF revealed normal findings as follows: Pressure—normal, no block; cell count—4 cells/c.mm., protein—20 mg. per cent, chloride—720 mg per cent, glucose—70 mg per cent and VDRL test—negative. X-ray of dorsal spine—normal.

When the patient developed this complication, prednisolone in a dosage of 60 mg. daily in divided dosage was added Continuous bladder drainage was instituted. The next six weeks were uneventful as no change was noted in the patients' condition. Chloramphenicol was discontinued during this period. Sulphadiazine had to be given in view of the urinary infection. A bed sore which developed required frequent dressing Prednisolone was tapered in decrements of 10 mg weekly and discontinued Following this static period, to the satisfaction of all concerned, some movement returned in the left toes Soon movements were possible in the left knee. During the next three months steady improvement was noted, as a result of which the patient could be enabled to walk without support. Bladder continence developed during this period. Sensory deficit showed marked clearance. But some residual pyramidal signs by way of spasticity, brisk reflexes, clonus and extensor plantar response were present at the time of discharge on 19-3-1972.

DISCUSSION

A case of acute transverse myelitis developing as a complication of typhoid fever is described. This complication developed during the third week, when the patient was apparently recovering. The onset was sudden and there was a long period of lack of any improvement. But once improvement started, steady progress was maintained. Contrary to the general impression that focal neurological complications of typhoid fever leave gross residual damage, this case illustrates that some cases, at least, do make satisfactory functional recovery.

SUMMARY

A case of acute transverse myelitis complicating enteric fever with good recovery is described. A brief summary of the important neurological complications of typhoid fever is also dealt with.

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5

Otogenic Tuberculous Meningitis

S. S. DAVID*, V. VENKATARAMAN**

Tuberculous otitis media is now a rarity after the advent of antituberculosis drugs. The disease is common throughout childhood and early adult life after which it becomes increasingly rare. Turner (quoted by Stewart and Lumsden, 1961) found that, in otitis media at all ages tuberculosis accounted for only 2.8 per cent of the cases.

Infection of the middle ear cleft may occur either by the eustachian tube route or by way of blood stream. Majority of the cases of tuberculous disease of the middle ear cleft in children and adults are secondary to pulmonary tuberculosis. The infected particles may be aspirated through the eustachian tube during the acts of coughing and sneezing. The tonsils and adenoids may become infected first and act as a receptacle for tubercle bacilli before tubal spread commences. The spread of infection is said to be usually along the lymphatics of the eustachian tube or mucosa of the canal itself. Secondary infection may also be blood borne from the tonsil, cervical, bronchial and mesenteric lymph nodes. Intracranial spread from the ear and mastoid bone takes place by direct infection, preformed pathways and venous thrombophlebitis.

Tuberculous middle ear disease should be suspected in an infant whose suppurative otitis media is not responding to treatment. Facial paralysis in a child suffering from mastoiditis is very often evidence of tuberculous infection (Ormorod, 1939). Depression of hearing out of proportion to other symptoms should make one think of tuberculous infection of the middle ear (Shambaugh, 1959).

CASE REPORT

A 15-year-old male patient was admitted to the Tirunelveli Medical College Hospital on 22-5-1971. The symptoms complained of were, fever, headache, vomiting, stiffness of the neck and discharge of pus from the left ear of two weeks duration. He had no history of cough or expectoration. There was no family history of pulmonary tuberculosis.

On examination the patient was irritable resented interference and disoriented His temperature was 103°F., pulse 104 per minute, respiration 30 per minute and blood pressure 100/40 mm of Hg. Neck rigidity was present Kernig's sign was positive. Plantars were extensor on both sides. Knee jerks were normal on both sides. Pupils were normal and reacting to light. Fundus revealed no abnormality. Heart and lungs were normal Liver was palpable 2" below the costal margin and was firm, smooth and tender. There was no splenomegaly or ascites

Otoscopic inspection– This revealed, thick foul smelling, purulent discharge in the left ear. The tympanic membrane was thickened, the landmarks were obscured, and there was a posterior marginal perforation. Tuning fork tests on 2nd June showed deafness of the conductive type with negative results in Rinne's test and with the sound in Weber's test referred to the affected ear. Tenderness was elicited over the left mastoid antrum and in the region of the left mastoid emissary vein.

Patient exhibited clonic spasms confined to the right side. He developed distension of bladder twice during the course of the stay in the hospital. On May 25th an upper motor neurone facial palsy on the right side was noticed and on May 29th homolateral nystagmus to the left was observed. After 21 days he developed herpes labialis.

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Investigations—Total leucocytes 18,200 per c. mm., neutrophils—90 per cent, lymphocytes—9 per cent and eosinophils—1 per cent.

Spinal tapping showed clear fluid under pressure. A "spider web" clot (fibrinogen) formed when the tube of fluid was allowed to stand for 12 hours. Tubercle bacilli were demonstrated in the cerebrospinal fluid by means of hydrocarbon floatation technique. C.S.F. analysis on various dates is shown in Table 1.

Table 1—*Showing Results of C.S.F. Examination on Various Dates*

Date of examination	Proteins in mg per cent	Chlorides in mg. per cent	Sugar in mg. per cent	Globulin	Cells lymphocytes per c. mm.
22.5.71	45	700	46	Nil	20
25.5.71	60	700	138	Trace	40
7.6.71	140	620	80	Trace	28

Smear and culture of the ear discharge for A F.B. were positive. Culture of the pus from the ear for other organisms showed growth of Proteus moderately sensitive to penicillin and streptomycin.

X-ray chest was normal. X-ray mastoids showed sclerosis of the left mastoid. Blood sugar was 92 mg per cent. Urine examination was noncontributory Mantoux test was negative.

Treatment—Treatment was started with streptomycin 1 g. daily. In addition 300 mg. of isoniazid, and 15 g. of P.A.S. and 40 mg. of prednisolone were given daily. The clonic spasms were treated with phenobarbitone sodium. Crystalline penicillin 1,000,000 units were given six hourly for the Proteus infection. Mastoidectomy was postponed on account of the very weak condition of the patient.

The patient showed little improvement. He was discharged from the hospital on 16-6-1971 at request. At the time of discharge there was no headache or ear discharge or neck rigidity. The temperature was normal.

On June 27th he was re-admitted with fits and signs of meningeal irritation. He was again started on antituberculosis treatment. Ophthalmoscopic examination revealed blurring of both disc margins with dilated tortuous veins. There were no haemorrhages or exudates. On 10th July he developed weakness of the right upper limb.

In spite of treatment his condition deteriorated suddenly on 14th. He was gasping, pulse was very feeble and blood pressure could not be recorded. The patient was discharged against medical advise and taken home where he expired.

DISCUSSION

A case of otogenic tuberculous meningitis is reported. As a rule tuberculous otitis media and interna do not give rise to intracranial complications. But tuberculous pachymeningitis externa is frequently met with at operation. A number of cases of tuberculoma of the brain have been reported The absolute diagnostic test is the finding of tubercle bacilli in the spinal fluid. In this case Mantoux was negative and it is worthwhile noting, that in the last stages of tuberculosis in which there is overwhelming infection the allergic skin reaction is lost (Boyd, 1970). This is of great practical clinical importance. Probably overwhelming infection due to complete absence of immunity was the cause of fatal end of the patient.

ACKNOWLEDGMENT

We thank Dr. K. N. Vasudevan, for permitting us to use the hospital case records for preparing this paper.

We also thank Thiru S. Kandasami for typing the manuscript.

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Antituberculosis Chemotherapy
A Resume of the Rationale

The objective for any treatment is to cure the disease, but what 'cure' means in tuberculosis ?

The ideal is to destroy even the last tubercle bacillus and restore complete and continued structural and functional normalcy of the affected organ or system. What is true for an individual is equally true for a community or a nation. However, many factors make this ideal an unattainable utopia. Effective treatment requires trained personnel with an element of dedication to the cause of tuberculosis, and money allocated with an enlightened outlook and also utilised with zeal, integrity, and appropriate priority. This twin factor of men and money is too conspicuous by its inadequacy in our country even after 25 years of political independence.

As things stand today, all that we can contemplate is a 'control programme' to check the menace of tuberculosis. Eradication of the disease is merely a day dream under the existing circumstances. And in this whole set-up chemotherapy holds a key position so far as the already infected and clinically diagnosed cases are concerned.

This write-up is aimed at a rational resume of the status of chemotherapv that prevails today with particular reference in regard to the use of thiacetazone as a primary drug against the condition in combination with the universally accepted practice of administering isoniazid in all cases.

For critical consideration of chemotherapy it becomes imperative to take cognisance of the host factors prevailing. Though known since long to play a vital role in the development of the disease, host factors remained the sheet anchor in tackling the tuberculosis problem in the prechemotherapeutic era[1]. But it remains an undeniable fact that chemotherapy has diminished the therapeutic importance of host factors to an extent which is not yet fully realised by many physicians. Even with extremely unfavourable host factors, complete recovery has become possible with judicious choice of suitable chemotherapy.

Continuous study of host factors is of great importance and becomes all the more critically necessary as soon as the quality or quantity of the chemotherapy begins to deteriorate. Furthermore, the standards required for chemotherapy to be effective are in part dominantly dependent on host factors. These standards are determined by two main bacterial factors : the number of bacilli present in the lesion at the commencement of treatment and their sensitivity to the drugs used.

After assessing the operating host factors in a particular case, one has to consider the four factors which in a way govern the practice of chemotherapy, viz., the risk of development of bacterial resistance, toxicity of the drug used, ease of administration, and the impact of the cost involved on the general financial set-up of the individual or the family.

The words 'resistance' and 'sensitive' though used to express the same property of the tubercle bacilli may well be confusing even to experienced practitioners. These terms become meaningless unless the concentration of drug and the environment in which its activity is measured are specified. Moreover, various associations implied with this phenomenon are equally misleading. The 'patient', the 'strain' or the 'culture' is linked with impunity without realising the implications involved. The confusion is made worse when the oft used phrase "partially resistant" is used to describe the degree of resistance of a culture rather than the heterogeneity of the bacterial population constituting the culture. Thus clinician's approach and appreciation of laboratory reports vary so widely depending upon the degree of his conversance with the exact scientific connotations of these terminologies. An investigation[2] conducted in 72 hospitals in 17 countries showed 42 per cent patients are already nonresponsive to 1 drug, 18.5 to 2 drugs and 5.5 to 3 drugs. Figures for INH and streptomycin were 31.5 and 21.7 per cent respectively. The last decade has seen considerable advancement in technique of assessing the resistance phenomenon and it is evident now that the criteria and methods used a decade back invariably led to underestimation of the situation. With unlimited facilities and developed technology, a Japanese sanatorium had only 5 per cent patients carrying bacilli sensitive to the three classical drugs in 1960[3].

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[1] CANETTI, G.—Chemotherapy of Tuberculosis, 1964, Ed., V. C. Barry, Butterworths, London, p. 175

While toxic and allergic reactions of the drugs prohibit full exploitation of the potentialities of even the commonly used antituberculosis drugs, it is the general experience that average Indian has a better drug tolerance than an average patient of the advanced countries. This is brought out very clearly by the representative studies[4, 5] which put 12.2 and 20.2 per cent incidence which was bad enough to interrupt the treatment, while studies[6] by Tuberculosis Chemotherapy Centre, Madras, put these figures much lower.

Though none of the currently used drugs is free from toxic reactions, INH remains nearest to the ideal provided it is used in usual doses. A large dose requires pyridoxin or vitamin B complex supplement. Streptomycin does not go well with old age. PAS is seldom accepted without any revolting reaction from gastro-intestinal tract. Thiacetazone has proved to be better accepted as a companion drug with INH[6]. A recent study[7] showed that suitable additives not only enhanced the acceptability of thiacetazone but protected the liver which is prone to get damaged by prolonged use of the drug.

The prick of streptomycin is still a painful proposition to many, specially when advised for a long period. Dependence on patients themselves for its regular routined use, is destined to result in default. Self-administration, as of insulin in diabetes, has been advocated but it is yet to be practised to that extent.

The bulk of PAS is a problem for self-medication. Only INH in combination with thiacetazone has somewhat made the problem of administration a little easier. Since early sixties, thiacetazone has been accepted and used as a first-line antituberculosis drug in our country in combination with INH. The personal experience of this author corroborates considerably accurately the findings of a number of Indian workers[8-11] and using preparations with adequate protective additives the toxic reactions are also very minimal which conforms the findings of two recent studies[7, 12] conducted at Calcutta. Multiple daily doses to once a week regime have been tried and statistically evaluated results give enough scope for discussion both in favour and against each of the regimes. While some incriminate the protracted process of chemotherapy to be the reason for drug default, there are others who think that daily administration once accepted and practised as a routine is an easier and surer guarantee against drug default. Insufficient funds and too few trained personnel dictate the order of priority in developing countries, so that available resources could be wisely used. The dictum[13] "to give one year of chemotherapy to every newly diagnosed patient with active tuberculosis" leaves much scope for the clinician to choose the nature of chemotherapy. The period of chemotherapy is another point on which not only the disease status but the patient's temperament and tolerance and physician's tenacity and tactfulness cast their shadow. Continuous chemotherapy for a period of one year to 5 years or even more in certain conditions is easier said than followed. Initial favourable response and apparent recovery to an asymptomatic state loosens the link between the doctor and the patient and besides the botheration of too many durgs for too long a time a psychological abhorrence to continuation of medicine developes as an unexpressed evidence of lack of reconciliation with the awareness of the existence of the disease within in spite of apparent and evident wellbeing.

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Coming to the question of cost, INH-thiacetazone combination is the least expensive of all the combinations. Initial triple-drug therapy with streptomycin injection not only adds to the cost, it further enhances the same by the professional fees of the paramedical personnel who administer the injection. Certain clinical conditions call for consideration of corticosteroids which are helpful no doubt but prohibitive because of their cost. Unless fully taken over or heavily subsidised by either the Government or some voluntary institution to meet the demand of drugs, discontinuation or irregularity is more a rule than an exception with most of the patients who belong to either lower middle class or poor section of the society.

Problem cases, either because of bacillary resistance or some other complications, pose hopelessness and despair unless extra-ordinary medical skill and vigilance, exorbitantly costly and extremely toxic second-line medicines are mobilised to meet the situation.

Why such a long period of drug-drudgery! Evidences are enough to justify it. But can we not think of a future with fewer medicines for a shorter time ? To minimise the multiplicity of medicines efforts are being made to combine them in one single daily dose or even for longer intervals. But two or three medicines given together definitely behave differently inside the body so far as their metabolism and blood concentration are concerned. There seems to have been done very little work on this aspect of peak synchronisation study by which one knows when all drugs reach their maximum blood concentration simultaneously and have maximum synergistic antibacillary action in the body. It may require a little calculation of timing of administration of different drugs but will surely pay back very rich dividends by drastically reducing the total quantity of drugs and total period of their administration. It is time that our attention goes to the root of the problem of drug default or drug failure to evolve some means minimising their incidence assuring a surer, shorter and smoother chemotherapeutic regime.

SUJIT DHAR

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CURRENT MEDICAL LITERATURE

Role of Management in Health Services in Britain and the United States

BATTISTELLA, R. M. and CHESTER, T. E. (*Lancet*, 1: 626, 1972) from Sloan Institute of Hospital Administration, Graduate School of Business and Public Administration, Cornell University, Ithaca, N.Y., U.S.A. and the Department of Social Administration, Faculty of Economic and Social Studies, University of Manchester, comment:

Despite the many social and political differences marking the way in which Britain and the United States have dealt with the subject in the past, policy makers in both countries now seem to have arrived at a common position in focusing on management as the key for shaping the future of hospital and health services. Though the details are often vague and highly ambiguous, "effective management" has emerged as the predominant theme in the formulation of strategies for change. Drawing upon their joint experience in teaching and research on both sides of the Atlantic, the authors comment on the significance of this convergence in the light of the growth in size of health expenditures and exigencies of national economic policy. The objectives of management are made explicit and the relevance of modern managerial techniques is evaluated in the light of the broad social aims and special characteristics of health services.

The Greatest Killer

KOWALEWSKI, E. J. (*Texas Med.*, 66: 92, 1970) from American Academy of General Practice, Volker Vivd at Brookside, Kansas City, No. 64112, comments:

We try to educate the public to recognise diseases early, to encourage them to have periodic examinations, and to teach them a healthy way of life. We do all of these things to preserve and prolong life and to make life more comfortable for as many people as we possibly can.

Accidents are the leading cause of death among all persons age 1 to 37. Among persons of all ages, accidents are the fourth leading cause of death.

On an average day, year in and year out, the highway casualties in the United States total more than 10,000 injured; we have an average weekly death rate of more than 1,000.

We use up about eight million hospital bed days —or roughly 220 centuries, if you prefer—not to mention all the ancillary resources and scarce medical resources, each year. In fact, this is one of the heavy drains on our nationwide medical care system, particularly for the quadriplegics and the paraplegics that are common results of highway crashes.

For more than half a century now, the head injuries sustained on the highway have been prominent causes of epilepsy; brain damage that produces results exactly analogous to mental retardation and cerebral palsy also is common.

Extreme facial disfigurement is common-place, and we also are losing unknown numbers of unborn children as a result of crashes involving their mothers.

The fatality rate from crossover accidents on the highways with which we were concerned dropped more than 60 per cent; and on a national basis, highway fatalities from the same cause were reduced 30 per cent to 90 per cent on the nation's busiest express highways, after certain installations were made.

As important as these attitudes are, cornerstone of my practice always has been the use of counseling. Pre-natal, pre-marital, pre-retirement, and other types of counselling are successful; why not pre-driving counseling? I tried it and, after some preliminary experiences, concluded that the most encouraging area of potential influence in reducing automobile accidents is among drivers of all ages, but especially the young driver.

I explain that the preventive attitudes and measures he takes as a new driver likely will be one of the most important reasons for his attaining maturity without disability. If possible, I like to talk to the candidate alone, then conclude with a joint discussion with one or both parents.

Finally, with or without the parent, I suggest that this privilege of driving includes responsibility to self and to others. There is a need for self and family-imposed discipline. There should be a firm understanding by the young person that at the moment he begins to see laxity and carelessness in his driving, he must stop driving and take corrective measures until he satisfies himself that he once again is a safe driver. "If you do not recognise your deficiency yourself, then your mother and father will remove the driving privilege immediately and not allow you to enjoy it again until the safe attitude and the proper driving habits are restored."

Catecholamines

AXELROD, J. and WEINSHILBOUM, R. (*New Eng. J. Med.* 287: 237, 1972) from the Laboratory of Clinical Science, National Institute of Mental Health, Bethesda, Md. 20014, write:

Noradrenaline is present mainly in the sympathetic nerves of the peripheral and central nervous systems and acts locally on effector cells of vascular smooth muscle, adipose tissue, liver, heart and brain as a neuro-transmitter. Adrenaline is primarily located in the adrenal medulla and acts mainly as a hormone on distant target organs after its release from the adrenal gland into the bloodstream. Dopamine has two functions: it serves as a precursor of noradrenaline, and it presumably functions as a neurotransmitter in the areas of the brain involved in co-ordinating motor activity, where it is localised.

The mechanism whereby catecholamines are released from the adrenal medulla involves a process known as exocytosis. Upon chemical stimulation followed by membrane depolarisation, the chromaffin granule discharges not only catecholamines but also its entire soluble contents, including A.T.P. and specific proteins. Because both small and large molecules are released, it is thought that discharge occurs through the cell membrane rather than by diffusion through the cell cytoplasm. The vesicle membrane is not released with catecholamines, and calcium ion is intimately involved in the exocytosis process. Recent work in our laboratory as well as others indicates that a similar process of release of noradrenaline and dopamine-ß-hydroxylase by exocytosis is operating in the sympathetic neurone.

Circulating catecholamines do not cross the blood-brain barrier, and the catecholamines present in the brain are synthesised there. The brain contains noradrenergic as well as dopaminergic and serotinergic neurones. These biogenic amine-containing neurones are involved in the regulation of body temperature, ovulation, mood, behaviour and motor coordination. Cell bodies of noradrenergic neurones are localised mainly to the brainstem in the pons and medulla obolongata whereas serotinergic neurones are present in the raphe nuclei, and the cell bodies of dopaminergic neurones are concentrated within the substantia nigra. The processes of catecholamine biosynthesis, storage, release and re-uptake that occur centrally are similar to those described for the peripheral sympathetic nervous system

The sympathetic nervous system is in a dynamic state, but catecholamines in tissue concentrations nevertheless remain constant owing to a variety of regulatory mechanisms When sympathetic-nervous-system tone increases, the rate of synthesis of catecholamines with an enhanced amine turnover is stimulated. Measurements of catecholamine concentrations in tissue do not necessarily reflect the level of activity of the sympathetic nervous system. This activity can be gauged by measurement of amine turnover.

In some diseases such as pheochromocytoma and neuroblastoma the measurement of catecholamines or their metabolites in urine, serum or tissues is important in the establishment of the diagnosis, An example of a similar situation might be familial dysautonomia, in which it has been reported that levels of dopamine-ß-hydroxylase in circulation are decreased. Catecholamines or their metabolites may have a role in many pathologic states, including thyrotoxicosis, myxoedema, congestive heart failure, post-myocardial-infarction cardiac arrhythmias, idiopathic orthostatic hypotension and hepatic encephalopathy. In Parkinson's disease, affective disorders and hypertension, drugs that influence catecholamine metabolism are among the primary modes of therapy. The administration of dopa, a precursor of dopamine and noradrenaline that can cross the blood-brain barrier, overcomes the tremors induced by reserpine.

Drugs such as monoamine oxidase inhibitors and the tricyclic antidepressants (imipramine) have been used in the treatment of affective disorders. These drugs influence the biochemical disposition of noradrenaline and other biogenic amines. It has been suggested that their mechanism of action in depression may be through their ability to make more catecholamines available at central-nervous-system receptor sites. Monoamine oxidase inhibitors block the intraneural metabolism of these amines whereas tricyclic antidepressants block the inactivation of noradrenaline by re-uptake into the neurone Furthermore, it has been noted that in patients treated with reserpine, and drug that depletes biogenic amines, depression occasionally develops.

Intravenous Alimentation and Septicaemia

FREEMAN, J B., LEMIRE, A and MACLEAN, L D. (*Surg. Gynec. Obstet*, **135** · 708, 1972) from the Department of Surgery, Royal Victoria Hospital and McGill University, Montreal, write:

Intravenous alimentation has now been established as an invaluable addition to the armamentarium of the physician caring for seriously ill patients. The associated technical and metabolic problems can be managed with relative ease, provided that the patient is observed closely by experienced personnel at follow-up examination

Because of the properties of the solution and the nature of the patient population, an increased incidence of septicaemia is to be expected but not to be accepted complacently. Seven, or 21.2 per cent of the first 33 patients treated in this series, had Candida or Candida plus Gram-negative septicaemia. The correction of a number of technical faults in the mixing and administration of the nutritional solution probably was responsible for the reduction in the incidence of septicaemia to 2.3 per cent in the second group of patients. Continued attention to these technical details and to the maintenance of a completely closed intravenous line resulted in the absence of any infection in the third group of patients.

The number of patients reported is still too small to conclude that septicaemia can be completely eliminated by technical means. Additional steps are outlined which should facilitate early diagnosis and treatment, if invasive Candida sepsis develops. The appearance of Candida in urine which was previously sterile seems to be a particularly important sign.

Plasma-Corticosteroid Determinations for Assessment of Pituitary Response to Metyrapone

NATTRASS, M., SMITH, J., WOOD, P. J. and MARKS, V. (*Lancet*, **2**: 903, 1972) from the Department of Chemical Pathology, St. Luke's Hospital, Guildford, Surrey and the Department of Biochemistry, University of Surrey, Guildford, write:

Plasma—total—hydroxycorticosteroids (OH C.S.) have been measured by a competitive-protein-binding (C.P.B.) technique to assess the response of subjects to metyrapone. Adrenal 11-hydroxylase inhibition was shown by a fall in circulating 11-hydroxycorticosteroids (11-OH C.S.) measured by fluorimetry. It is suggested that a combination of fluorimetric and C.P.B. measurements of circulating OH C.S. is a better index of response to metyrapone than urinary 17-hydroxycorticosteroid (17-OH C.S.) excretion.

Can Diet be Responsible For the Initial Lesion in Diabetes?

WAPNICK, S., KANENGONI, E., WICKS, A. C. B and JONES, J. J. (*Lancet*, **2**: 300, 1972) from Godfrey Huggins School of Medicine, Salisbury, Rhodesia, write:

Jackson and his colleagues have suggested that the "initial lesion" in diabetes is an excessive secretion of insulin. If this suggestion is correct, it should be possible to detect an increased secretion of insulin associated with a decrease in glucose tolerance in populations undergoing economic development and in which diabetes is becoming more common We have measured insulin secretion and glucose tolerance in two contrasting sections of our African population to determine whether economic development in Rhodesia is accompanied by a change towards the European pattern and by the possibility that diabetes will soon become more prevalent.

The fasting glucose concentration, the oral glucose-tolerance curve, and the concomitant changes in serum-insulin were significantly lower in 50 African cleaners than in 12 Europeans 35 African students on a "Western" diet gave intermediate results Low blood-glucose and insulin concentrations seem to be characteristic of populations with a low prevalence of diabetes.

Sensory Perception Thresholds in Patients with Juvenile Diabetes and Their Close Relatives

CHOCHINOV, R H., ULLYOT, G. L. E and MOORHOUSE, J. A (*New Eng J. Med*, **286**: 1233, 1972) from the Endocrine and Metabolism Laboratory, Winnipeg General Hospital and the Department of Physiology, University of Manitoba, Winnipeg, Manitoba, observe:

Since a sensory deficit in diabetes might be early and generalised, tactile and special senses were studied in relation to onset and duration of diabetes. Fifty-nine healthy persons 19 to 40 years of age and 53 age-matched and sex-matched persons with juvenile-onset diabetes of four weeks to 27 years' duration had five sensory thresholds measured: light touch and two-point discrimination of the right index finger and great toe, visual flicker fusion, auditory fusion and electric taste. All senses tested were impaired in the diabetic group. Abnormalities were present with two years of onset for light-touch, flicker fusion and electric taste. The abnormalities progressed with time only for two-point discrimination and flicker fusion. Thresholds in the finger correlated with those in the toe. Subjects with an immediate diabetic relative had an abnormally high threshold for two-point discrimination in the finger. Wirespread defects in tactile and special sensory perception are present near the onset of juvenile diabetes.

Accidents of Vagotomy

WIRTHLIN, L. S. and MALT, R. R. (*Surg. Gynec. Obstet.*, **135**: 913, 1972) from the Surgical Services, Massachusetts General Hospital, and the Department of Surgery, Harvard Medical School, Boston, write:

In 1,096 patients who had undergone truncal vagotomy, accidents added a 5 per cent complication rate to the surgical management of duodenal ulcer disease. Three deaths, 0.27 per cent, could be attributed to vagotomy. Splenic trauma and postoperative haemorrhage accounted for 60 per cent of the complications, and injury to the oesophagus was responsible for 33 per cent.

Exercise Tolerance of Patients with Chronic Lung Disease

WOOLF, C R (*Canad. Med Ass J*, **106**: 1289, 1972) from the Department of Medicine, University of Toronto and the Pulmonary Unit, Toronto General Hospital, Toronto, Ontario, states:

A Chronic Chest Disease Rehabilitation Programme has been developed in the Toronto General Hospital to improve exercise tolerance in very disabled patients. The most important part of the programme is physical conditioning using mainly a motor-driven treadmill The treadmill exercise is done breathing room air or, in the case of the most disabled patients, an oxygen-enriched gas mixture. Other exercise includes riding a stationary bicycle, going up and down stairs, and turning a wheel by hand. Other aspects of the programme are breathing exercises, inhalation therapy using an ultrasonic nebulizer, chest physiotherapy, and patient education. The importance of a team approach with encouragement, enthusiasm and demonstration of steady progress is emphasised.

Lung Cancer

WEISS, W., BOUCOT, K R., SEIDMAN, H. and CARNAHAN, W. J. (*J. Amer. Med. Ass.*, **222**: 799, 1972) from the Philadelphia Pulmonary Neoplasm Research Project, the American Cancer Society and the National Tuberculosis and Respiratory Disease Association, New York, observe:

The risk of developing various histologic types of bronchogenic carcinoma was determined in a ten-year prospective study of 6,136 older men in relation to smoking habits at the beginning of observation. No lung cancer developed in 830 non-smokers. Among the 2,580 men who regularly smoked cigarettes only and who were current smokers on entry, the risk of lung cancer increased with increasing daily cigarette consumption. The cancers were typed according to a modification of the World Health Organization classification. Well-differentiated squamous-cell carcinoma, small-cell carcinoma, and adenocarcinoma showed a dose-response relationship to cigarette smoking, but poorly differentiated squamous-cell carcinoma did not.

The above data are consistent with ours and suggest that Kreyberg's assumption of little or no casual relationship between cigarette smoking and adenocarcinoma is not justifiable. In our study there were no adenocarcinomas among men who never smoked regularly, and, though the number of cases was small, the 14 adenocarcinomas that developed among cigarette smokers seemed to be dose related.

The analysis of our data indicates that among the cancers classified as squamous-cell carcinoma there is an increasing ratio of well-differentiated to poorly differentiated tumours with increasing cigarette dosage. Since the number of cancers in each group is small, conclusions must be tentative. Nevertheless, the idea that increasing cigarette dosage may be associated with increasing differentiation of squamous-cell carcinoma is intriguing. This finding requires confirmation.

Analgesic Nephropathy

KINGALEY, D. P. E., GOLDBERG, B., ABRAHAMS, C., MEYERS, A. J., FURMAN, K. L. and COHEN, I. (*Brit. Med. J.*, **4**: 656, 1972) from the Departments of Nephrology and Pathology, University of Witwatersrand, South Africa, comment:

Sixty-six patients were seen from January 1963 to December 1970 in whom a diagnosis of analgesic nephropathy was made. The ratio of women to men was 2.7 : 1 and women presented at an earlier age. Over 60 per cent of patients had or developed urinary tract infection and over one-third presented with serum urea levels over 300 mg./100 ml. Hypertension was present in 60 per cent of patients and almost 20 per cent had a history of peptic ulcer; hysterectomy had been done in 35 per cent of the women. Most patients improved initially but more than half of those followed up died within five years of presentation. A direct relation was found between prognosis and the degree of functional renal impairment at presentation. Hypertension appeared to have an adverse effect on prognosis but no relation of prognosis to papillary necrosis, infection, or surgical procedures was found.

Surgery for Coronary Artery Disease

ROSS, S. RICHARD (*Bull. N.Y. Acad. Med.*, **48**: 1163, 1972) from Clayton Professor of Cardiovascular Disease, Johns Hopkins University School of Medicine and Hospital, Baltimore, observes:

Surgical therapy for coronary disease can be placed in perspective in 1972 by listing certain facts which are known about the aortocoronary-bypass operation and preparing another list of important unknowns. First, the known facts:

The operative mortality ranges from approximately 3 per cent to 10 per cent. Ventricular function is an important determinant of operative mortality. The more severe the impairment of function, the higher the mortality.

The flow through the grafts is significant, with measurements ranging from 30 to 90 ml.min.

The patency rate at two years varies from 60 per cent to 80 per cent.

Symptomatic improvement can be expected in 85 per cent of patients.

Objective evidence of improved exercise tolerance can be expected in 85 per cent of patients.

The unknowns at this time are:

1) The effect of the operative procedure on the natural history of the disease as manifested by the incidence of death and myocardial infarction. 2) The incidence of postoperative myocardial infarctions. 3) The fate of the vein graft. 4) The fate of the native circulation.

Management of Thalassaemia

Editorial Comment (*Lancet*, **2**: 267, 1972).

The thalassaemia syndromes are a group of inherited anaemias that are due to abnormalities of haemoglobin formation. Originally they were described in the populations about the eastern Mediterranean, especially in Sicily, Sardinia, southern Italy, and Greece, and in people originating in these areas who had emigrated to the United States of America, where the anaemia was first described by Cooley. Later a considerable number of affected individuals were found in Thailand and the Malay peninsula, and eventually Lehmann and Huntsman were able to list cases from many places and among many racial groups.

Consequently any child from these parts of the world should be sent for appropriate investigation, preferably before any treatment with iron or folic acid. Diagnosis, by examination of haemoglobin electrophoretic patterns, is usually easy; occasional exceptional forms of thalassaemia can be difficult. Once the diagnosis is made, the question of management has to be decided; although we cannot remove the abnormality, a lot can be done to relieve the symptoms.

"The main lines of treatment are those of blood transfusion, prevention or early management of infection, the judicious use of splenectomy, the removal of excess iron, and the maintenance of adequate levels of haematinics, especially folic acid"; and they emphasise that oral or parenteral iron should not be given. The affected children first show symptoms at the age of about 3 months; anaemia is prominent and progressive, diarrhoea is troublesome, the child fails to thrive, hepatosplenomegaly is found, and without blood-transfusion the child soon dies.

There are two views of how to manage what will be a lifelong transfusion regimen. One is that the haemoglobin level is best kept as near normal as possible; children treated this way have a better rate of growth, fewer complications, and less trouble with skeletal deformities. The other is that the main danger to patients on regular transfusions is the accumulation of iron in the tissues, which will eventually lead to a fatal haemosiderosis; so only enough blood is given to keep the haemoglobin at all times above 5-6 g. per 100 ml.

The introduction of iron-chelating agents, which enable iron to be excreted, has done something to ease the problem of iron overload. Two preparations are available: desferrioxamine is given intramuscularly and diethylenetriamine pentacetate (D.T.P.A.) intravenously, usually by adding it to the blood-transfusion.

The dose of the chelating agent theoretically be sufficient to prevent excess iron in the tissues of thalassaemic patients and can be obtained by a daily dose of 0.5-1.0 g. of desferrioxamine or 6 g. D.T.P.A. with each transfusion.

Splenectomy has been advocated for thalassaemia for many years; it is said to reduce transfusion requirements, to relieve the patient of an abdominal mass, and to be particularly useful in those patients who develop evidence of hypersplenism.

Seizures in the First Week of Life

HOPKINS, I. J (*Med. J. Aust.*, **2**: 647, 1972) from the Department of Paediatrics, University of Melbourne, comments:

Seventy-five consecutive infants who had has seizures in the first week of life, born in one obstetric hospital, are being followed up in a longitudinal study. In this report possible aetiological factors of neonatal convulsions are examined. Infants who had had seizures were compared with a control group to assess obstetric and other factors operating before birth and were comprehensively investigated to detect metabolic disease, infection and other causes of convulsions. Cerebral hypoxia, usually diagnosed on the basis of foetal distress, was thought to be present in 43 infants. Twentynine infants had hypoglycaemia, 27 had hypocalcaemia and six had hypomagnesaemia. Many of the infants with metabolic disturbance had had previous foetal distress. Infection was thought to be the cause in eight infants and cerebral haemorrhage in four. It is concluded that frequently there is a combination of factors—particularly obstetric events predisposing to foetal hypoxia and neonatal metabolic disturbance—leading to neonatal seizures.

CURRENT TOPIC

What is Biophysics and Why ?

BIJON ROY*

Bio-physics is an interdisciplinary scientific discipline with its one foot on biology and another on physics. Consequently, it has an increasing impact on the science of medicine and biology. No branch of medicine, today, can go without its direct application. Biophysics which is playing the most important role in clinical sciences, as practised in hospitals covering all its aspects, e.g., diagnosis, investigation and treatment, is opening up new possibilities for the future of medical and biological sciences.

The present day medical science is thus experiencing a major explosion of knowledge of biophysical sciences. One of the primary objects of medical education is to translate these new discoveries into practical knowledge laying the foundation of new scientific disciplines. Perhaps, a direct result of such practice had been the birth of biochemistry and biophysics. Compared to biochemistry, biophysics is a new comer in the field of biology and medicine, although, its ideas and methods were known to biologists as back as the days of Harvey (1928). Glasser (1944) has rightly stated: 'The science of physiology began with Harvey and he was the first to apply systematic measurements in biologic investigations and to attempt to correlate biologic phenomena with physical laws'. In short, physics supplied instruments and methods of measurements in those days that have led to many discoveries in physiology and medicine and the methods of physical research have revolutionised many of the older approaches to the biologic sciences.

These facts have always been recognised to some extent in those days.

While a number of textbooks have been published *pari pasu* no significant progress was achieved toward publication of biophysical journals or in the organisation of biophysics. In 1937 the 'Bulletin of Mathematical Biophysics' was founded in Chicago under the editorship of Nicolas Rashevsky and this is the only special journal in biophysics which has enjoyed a continuing success.

Despite every attempt in those days to place physiologic physics (biophysics) on a basis comparable to that of physiologic chemistry (biochemistry), only isolated and sporadic progress was made in this direction, while at the same time great impetus and

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emphasis were given to the chemical aspects of biology. This led to significant developments in biochemistry, within a very short period. The development was so great and phenomenal that biochemistry eventually became a definitely established branch of science distinct from both physiology and chemistry. Biophysics, as a subject, however, remained far behind during the period biochemistry grew up as a separate subject, although biophysics started its career relatively earlier than biochemistry.

The reasons for this were best summarised by a group of twenty-seven leaders in the field of biophysics. According to them most of the treatise in those days designated as biophysical work was either a biological investigation using modern techniques or work on physics using biological materials so that collection of all these publications in one biophysical journal or in one textbook became slightly problematical which ultimately delayed or still delaying the progress of this new discipline. This can be overcome only if we know what we mean by biophysics, that is, what is biophysics ?

To understand what is biophysics, today, we must know firstly, what biophysics is not ? and then secondly what it is ? The subject has been dealt with at length by Hill (1954). According to him, biophysics does not consist of teaching physics to medical students or students of biology. It does not consist of constructing or maintaining physical equipment for use by physiologists or biologists. The employment of physical instruments, namely, microscope, a balance, an x-ray equipment, a Geiger counter or a pH meter in a biological laboratory does not make one a biophysicist, or else a medical doctor using a stethoscope involving a lot of physics of acoustics could automatically be recognised as biophysicist. Even radioisotope or x-ray crystallography works on materials of biological origin is not in itself biophysics nor even working on muscle and nerve does confer any biophysical status. It all depends on the motive, the idea, the method and manner of approach.

What then biophysics is ? It is the study of biological functions, organisation and structure by physical and physiochemical ideas and methods and its interpretation with the help of physical laws and principles. Like all other sciences biophysics begins with research. Likewise, the elements of a research experiment in biophysics consist of the biophysical system, the stimulus, the response and the law or laws of the system. The manner in which, response is related to stimulus is described by the law of the system (Trimmer, 1950). System laws, therefore, are generalised quantitative statements, describing the behaviour of the system (Uber, 1950). Biophysics primarily aims at deriving such generalised quantitative laws for biological systems with reasonable accuracy applying systematic isolation operations to eliminate uncontrolled variables whenever and wherever required and thereby obtaining a set of data as the response of the system for a predetermined stimulus. An equation describing the behaviour of the system can then be determined. If all the factors affecting the system can be incorporated in a single equation what we obtain is called the generalised law of the system expressing its behaviour. The behaviour of the system can, however, be expressed both in integral as well as in differential form. A system is then called a simple one if firstly, the differential form of expression of its laws can be solved mathematically to yield the integral form and secondly, the system does not involve more than two variables (Stacy *et al.*, 1955).

In case these two requirements are not met with the system is complex and cannot be easily analysed. Nevertheless, it is a great help to recognise a system to be complex as it saves a lot on the part of the investigators. Under these conditions the system may be handled in any of the following ways: (i) simplification of the complex system by certain assumptions or neglecting certain minor factors, (ii) isolation of system components to reduce it to simple system, (iii) replacing the system by theoretical physical models, e.g., Lillie iron wire model of nerve, equivalent electrical impedance of cell membrane, etc., (iv) limiting handling of the complex system to a group of variables as single variable in the form of a parameter. These simplified approaches although have inherent limitations can reveal many facts about the behaviour of the system.

To summarise, the aim of biophysics is to put behaviour of biological system in laws in the form of equations, the object being to find the simpliest possible relationship for the response of the system to a predetermined stimulus If the equation turns out to be a generalised quantitative law we know everything about the system. On the other hand, if the law turns out to be a complex one we take a number of steps to reduce it to a simple system. If such an attempt fails we replace the system by a physical analogue or we limit handling of the system to a parameter to get as much information as possible.

This clarity in the perspective of biophysics as a subject is essential before it develops as a separate subject. The idea that biophysics or medical physics is meant only for helping research and teaching in biology or medicine and for providing technical personnel for hospital works is an old fashioned idea arising out of a lack of clear perspective about biophysics as a subject. Such wrong approaches to the problem, has resulted in a number of deviations delaying its all out development . These deviations are, firstly, to do 90 per cent biology and 10 per cent physics, secondly, to do 10 per cent biology and 90 per cent physics and thirdly, to recognise a part as all important in the subject. The first category of workers may be recognised as modern biologists or physiologists since they use sophisticated physical instruments to do biological research but could not be designated as biophysicists. Likewise, the second category may be looked upon as supertechnicians since they with their limited knowledge in biology could render only technical help to clinicians or biologists. This means that biophysics is, perhaps, as unsuitable to biologists who know no physics as it is to physicists who know no biology and hence the urgent need of introducing biophysics as a separate subject in medical teaching or in teaching course in biology. The third, although mentioned last, is the most serious type of all deviations. It is a sort of a sectarian outlook keeping the subject dwarf for all times to come. The deviations as enumerated above may be encountered in all spheres of biophysical activity throughout the world whether in teaching, research or organisation. A fairly comprehensive idea about the extent of development of biophysics in different countries can be had from the account by Cook (1965)..

So, to pursue a successful career in biophysics, needed urgently for the sake of future of medical (biology) science, it is necessary to fight all these deviations. It may simply be stated that this is only possible by creating departments of biophysics and introducing systematic teaching on the subject both at the undergraduate and postgraduate levels, embracing all aspects of biophysics. As such the teaching will consists of (1) General biophysics including biomathematics, (2) Bioenergetics, (3) Bioacoustics, (4) Bio-optics including electron optics, (5) Bioelectricity, (6) Bioelectronics and (7) Radiation biology.

It may be mentioned that the establishment and growth of biophysics as a separate subject will by no means minimise the role of biochemistry. Rather, biophysics will serve as an important and necessary adjunct to biochemistry and the two together will play a complimentary role in the domain of medicine and biology. This means that one should develop as much as the other. This again certainly does not imply that biology will finally become simply physics and chemistry. On the other hand, physics and chemistry have in the end a great deal to learn from biology. Perhaps, biophysicists can realise this truth better than anybody else and like to invite physicists, engineers and others to come close to the living world just for their own benefit, just to get new ideas in their own fields (Hill, *loc. cit.*).

Departments of biophysics when established will have the following functions: (i) help the hospital in diagnosing and treating disease of patients and also in clinical research and investigations, (ii) teaching and training of medical technical staff leading to B.Sc. degree in Medical Technology (B.Sc. Med. Tech.), (iii) teaching of medical physics to undergraduate and postgraduate medical (biology) students including their thesis works, (iv) departmental teaching leading to M.Sc. and Ph.D. degrees and departments own research works.

Most of the countries in the world are now seriously thinking of giving more emphasis on biophysics in medical and biological establishments by creating separate chairs in biophysics both at the university and at government levels and have made significant achievements in this direction already. It is expected that the Indian subcontinent will not lag behind these achievements.

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NOTES AND NEWS

Leprosy Training Course at School of Tropical Medicine, Calcutta

The School of Tropical Medicine, Calcutta, will hold a Leprosy Training Course intended for medical persons from 11th July to 10th August, 1973. No fees will be charged. Applications in the prescribed form, available at the Leprosy Research Department of the School, should be sent to the Director, School of Tropical Medicine, Chittaranjan Avenue, Calcutta 12 by *29th June, 1973.*

V Asia and Oceania Congress of Endocrinology

The 5th Asia and Oceania Congress of Endocrinology will be held on 28 January—1 February, 1974, at the Postgraduate Institute of Medical Education and Research, Chandigarh, India. The last date for receipt of abstracts of papers and registration is *31st August, 1973.* Enquiries for further details may be made to Dr. G. K. Rastogi, Organising Secretary, Department of Endocrinology, Postgraduate Institute of Medical Education and Research, Chandigarh-11 (India).

Prize Announced for Best Paper on Vitiligo

The Western India Branch of the Indian Association of Dermatologists and Venereologists has invited entries from Indian medical graduates and allied scientists, whether residing in India or abroad for its Annual Prize for the best paper on Vitiligo. Original unpublished work on any aspect of Vitiligo will be considered for the award. The prize, donated by the Paragon Charitable Trust, Hamam House, Bombay 1, consists of a medal and Rs. 1,000/- annually in cash tenable initially for 5 years and may be extended beyond that period, if the response is encouraging. The prize-winning condidate will be required to present his paper at the annual conference of the Association and his paper will be under the copyright of the Association's journal. The paper in triplicate should be submitted to the Secretary, Western India Branch, Indian Association of Dermatologists and Venerologists, C/o. Dr. T. K. Mehta, 20 M. P. Marg, Bombay 4 latest *by end of September, 1973.*

III National Conference on Infectious Diseases

The Third National Conference on Infectious Diseases will be held in Bombay on December 8-10, 1973, under the auspices of Indian Association for Communicable Diseases. All enquiries in connection with the conference may be addressed to Dr. S. A. Kamat, Organising Secretary, 47, Gokhale Road, South Dadar, Bombay 400028.

Vaccine Against Leprosy

Norwegian and Swedish research scientists at the Amauer Hansen Research Institute, Addis Ababa, Ethiopia, claim to have developed a vaccine against leprosy, according to the Swedish daily *Svenska Dagbladet*.

The basis of the new vaccine is *mycobaceterium duval*, a bacillus similar to the leprosy bacillus, but which is harmless to man.

Tests on volunteers showed that the bacillus produced the same antigens as the leprosy bacillus.

The group of scientists, led by the Swedish doctor, Goeran Kronvall, will present its observations to the International Leprosy Congress at Bergen, Norway.

Ultrasonic Camera to Show Internal Organs

An ultrasonic camera being developed at Stanford Research Institute, California, will display live television images of internal organs including their movements and other soft tissues invisible to x-rays, researchers say.

The scientists at the institute hope the device will prove effective for detecting heart disease, cancer and other diseases as well as recording the movement of the human foetus.

The camera will work by bouncing sound waves off of internal organs to produce a live television image of the organs and their movements, according to Mr. Earl Jones, Head of Biological and Electrical Engineering Department of the Institute.

Diet to Replace Dialysis

A Johns Hopkins University medical researcher claims to developed a diet regimen which could replace or reduce the need for dialysis in patients suffering from severe kidney disease.

The procedure sharply curbs proteins in a patient's diet and substitutes for them keto acids— the components left when nitrogen is removed from proteins.

Dr. Mackenzie Walser, Professor of Pharmacology and Experimental Therapeutics at the University, said at Baltimore although the body's protein needs continue to be met, the combination of a strictly meatless diet and keto acids does not produce the toxic blood wastes that must currently be removed by blood-cleansing dialysis.

For some patients the regimen could eventually reduce or replace costly dialysis and high-risk organ transplants, Dr. Walser said.

While the system still requires considerable research before it can be widely applied, the professor said, "it is clear that for patients with certain levels of severity, the treatment can replace dialysis".

Dr. Walser said patients whose kidneys function at 2 to 10 per cent of the normal level appear to be the most suitable candidates for dietary regimen.

The treatment does not prevent deterioration of kidney function, he emphasised.

Filter Stops Blood Clots

Lung embolies following operations are a frequent cause of death. In England, some 2,500 patients die of this each year. A blood filter developed a few years ago by K. Mobin-Uddin, an Indian physician practising in the U.S.A., seems to increase the chances of putting an end to emboly fatalities in the future. This was underlined by reports from Freiburg (Federal Republic of Germany) where the filter was successfully tested on ten patients.

The first emboly usually does not cause death. But the process can be repeated several times so that a later clot can turn out to be fatal after all. The Mobin-Uddin Filter is therefore placed in the main vein of the lower part of the body after the first warning of a non-fatal emboly. A long, thin, flexible tube, similar to the shorter heart catheter, is introduced *via* the large throat vein until the protective filter at the tip of the catheter reaches its set place below the kidneys. The filter unfolds, the catheter is detached from it and extracted.

Tests with the filter which were carried out on 100 patients in Miami (U.S.A.) before 1970 were less convincing than the latest experiments in the Federal Republic. The Department for Coronary and Vascular Surgery at the Surgical Clinic in Freiburg carried out this operation on ten patients immediately after the first dangerous emboly. In the following 11 month observation period, no more embolies or serious complications were registered. Two further embolies had taken place after the filter was implanted in Miami. One was fatal. In both cases, the filter proved to be full of retained blood clot particles so that the blood was forced to make a detour in the vein. Thus the new blood clot particles were still able to make their way to the lungs.

The Freiburg experts have underlined the great necessary. They point to the case in which the opera-experienced specialists only. Anaesthesia is not necessary. They point to the case in which the operation was not performed skilfully enough so that the young patient's major vein and the adjoining ureter were cut—*News from Germany.*

CORRESPONDENCE

The Editor is not responsible for the views expressed by correspondents

Rural Medical Service

SIR,—Rural Medical Service is being unnecessarily complicated under the present health policy of our Government who have unfortunately been fumbling over initiating an effective scheme. Let me analyse the position *de novo* though leaders of medical profession have been crying hoarse for years to create a scientific approach to the health-problems of rural populace.

Qualified doctors are being urged upon to rush to rural areas and start their service without any modern equipment, etc., to which they have been accustomed during their long and strenuous course of study. Much to our dismay our rulers have unfortunately taken up threatening attitudes. Doctors who have obtained their qualification at the cost of long and assiduous application exposing themselves to the infection of countless diseases would have to satisfy our rulers through rural service before they could have their legitimately earned qualification. A queer explanation has been advanced that the Government has been made to stand a huge share of their educational expenditure and as such, it has every right to exercise Shylock's claim to have a pound of flesh from these budding medicos.

Are the doctors really disinclined to work in the rural environs? No,—they are ready to accept the responsibilities provided their present and future careers are fully assured in respect of their financial gain, living conditions, educational opportunities of their children and future prospects. Medical Science particularly modern scientific treatment is beset with progressive evolutions. No doctor likes to be fossilised in the rural corners as his brain has to be kept abreast of the advances of this life-saving science. A Government worth the name has a moral responsibility to enlist the service of a doctor in proper environment and then encourage him to advance in his knowledge and experience for patients' benefit. Has our Government any fool-proof scheme to develop really useful health-centres? If so, how could it tink of wasting time, energy and money in encouraging quackery by employing some educated people to make a show of medical service in villages? Could this be called medical aid at all? It is undeniable, of course, that doctors cannot work without paramedical assistant who after thorough training directly under doctors become useful.

A great mischief lies in the efforts of the Government to set up Homoeopathic, Ayurvedic and possibly Unani systems in rural areas to make a wide show of medical attention. Physicians attached to these systems will feel inclined to pick up Allopathic treatment in company with qualified doctors and then become highly experienced quacks to be fully utilised in future by political contestants in election-campaigns.

Quackery is an irresistible, social crime. Even the grand-mother in a family learns it through blind usages. There is hardly any space on earth where quacks do not exist. But has any country ever tried to accept them as dependable doctors by granting recognition? It is not intelligible why our Government is not prepared to consider the problems of qualified doctors who have earned their rights by dint of hard and expensive education. Every qualified doctor is willing to render rural service for some years provided the scheme of work has a scientific basis. Rural people of India are not enamoured of quacks. They will extend their whole-hearted cooperation to qualified doctors if they can serve the people properly. To assure this the health-centres have to be developed for instituting modern treatment. Besides fresh medical talents highly experienced and able-bodied, old and retired doctors would also prefer to work in rural dispensaries for some years. Their experience would be of immense value to treat difficult diseases.

So, what is needed now is a changed outlook of our rulers who should not forget that doctors have also human souls to feel for the diseased humanity. Even the top-most medical consultant in a city does not earn more than an astute lawyer and he has also to find time to attend his colleagues, friends and relatives free of professional charge.

I am, etc.,

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Calcutta-33. B.Sc. (Cal.), M.M.F. (W.B.)

Consulting Physician

SIR,—In his letter appearing in March 1, 1973 issue of your esteemed journal (*J. Indian M. A.*, **60**: 183, 1973) Dr. K. P. Musthapa of Cannanore poses two questions that need hardly any explanation.

A consulting physician is one who is called in by colleagues or applied to by patients for advice in special cases (C.O.D.).

But there is practically no line of separation that divides the consulting physician from the attending one. In a wider sense an ordinary physician may be a consulting one whom he does not himself take up the operative part of the treatment he has enjoined on his patient. Again, a consulting physician has to play the part of an attending one under special circumstances, as for instance, in an emergency when there is risk to the life of the patient before his eyes.

A cardiographer is a cardiographer in the proper sense of the term if he has the skill and knowledge in that branch. Mere success in any examination does not invariably make one perfect, wise and skilful. It is through indefatigable industry and application that real success can be attained. If we turn to the biographies of great men of all times, we derive the same lesson. In our country too, instances are not rare when physicians with ordinary medical degrees have risen to such eminence as has prompted the posterity to place them in the same rank as that of medical men with very high academic qualifications.

I am, etc.,

P.O. Deulbarh, PARESNATH BHUIAN
Midnapore L.M.F.

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SIR,—Dr. K. P. Musthafa has raised two queries in his letter published in March 1, 1973 issue of your journal (*J. Indian M. A.*, **60**: 183, 1973). Both the questions relate to the same problem, viz., whether a doctor with no postgraduate degree can be called a consultant. The answer appears to be a very simple "yes". In my opinion, if any doctor sees only cases referred to him by other practitioners or practices only a speciality, he deserves to be called a consultant. There are in India and even abroad, a few consultants who see cases which come direct to them and who prescribe medicines but do not dispense the same. This practice cannot be avoided because of the conditions in our country. Strictly speaking, such a doctor is not a consultant although it can be argued that since the patients only consult him but do not take medicines from him he should be called a consultant. In many countries in Europe and Japan the basic degree is M.D., equivalent to the M.B.B.S. of our country. There are no special degrees awarded to the consultants in those countries. The consultant gets his status only by dint of his hard work and experience in his speciality.

In my opinion every general practitioner should be encouraged to specialise in some branch of medicine so that when he becomes older he can concentrate on his speciality. He will then be eligible for being called a consultant or a specialist. His work will thus become lighter as he grows older.

In England many postgraduates with M.S., M.S., F.R.C.S. or F.R.C.P. qualifications practice as general practitioners. This is not considered *infra dig*. Thus doctors with postgraduate qualifications can become general practitioners if they wish to do so, just as general practitioners are eligible for becoming consultants or specialists if they decide upon it.

I am, etc.,

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REVIEWS

International Histological Classification of Tumours No. 6—Histological Typing of Bone Tumours (148 colour plates and accompanying a set of 150 colour transparencies—by F. Schajowicz, L. V. Ackerman and H. A. Sissons in collaboration with L. H. Sobin, H. Torloni and pathologists in thirteen countries, 1972, World Health Organization, Geneva, 23.5 cm. × 15.5 cm., pp. 60, price: Book only: £ 5.50; $ 14.00; Sw fr. 55; Book and slides: £ 18; $ 47.00; Sw fr. 180.—Available through: WHO Regional Office, New Delhi and The Oxford Book and Stationery Co., New Delhi and Calcutta

This book is the 6th in the series of International Histological Classification of Tumours. I have gone through its predecessors also; and I have no hesitation to state that the high standard has been maintained in its publication. Even today, a tumour with same histological picture is sometimes known by different names in different parts of the world and sometimes the same name may indicate tumours of different histological appearances. This is highly undesirable and these books will go a long way to avoid such discrepancies. This volume will be considered a bright jewel in any scientific library.

M. L. CHATTERJEE

Biological Activities of Complement—Editor D. G. Ingram, 1972, S. Karger, Basel, Munchen, Paris, London, New York, Sydney; 24.4 cm. X 17 cm.; pp. VIII+288, 64 Figs., 39 tables., U.S. $23.55, £9.25

The book is the outcome of the proceedings of the 5th International Symposium of the Canadian Society for Immunology, Guelph, 1970. In the past, the definition of complement has been restricted to its action in lytic and bactericidal activities, but complement is now recognised as an important contributor to a number of biological phenomena including chemotaxis, phagocytosis, anaphylatoxin generation, adherence reactions of blood cells and tissue changes. As stated in the 'preface' of the book, 'the symposium was intended not to be one specialist speaking to another specialist, but rather, the specialist reviewing the current status of research in his speciality and interpreting recent progress to other immunologists and to new research workers interested in entering the field of complement research.'

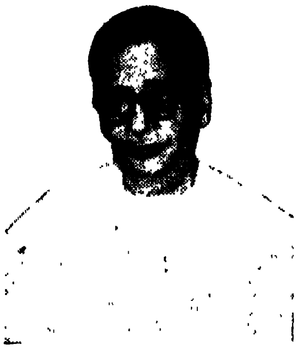
The book has a rich collection of recent references and will be of immense value to those carrying on medical research in general and to immunologists in particular.

J. K. SARKAR

OBITUARIES

Dr Bidhu Bhusan Bose

Death took place of Dr. Bidhubhusan Bose on 17-2-73 at Calcutta following a heart attack. Dr. Bose was born on 23-11-1901 at Bhagalpur, Bihar. His forefathers, who settled at Bhagalpur about 150 years ago, originally came from Dacca, now in Bangladesh. He received his early education at Bhagalpur and came out first in the Matriculation examination from that division. He also secured the first position in I.Sc. examination from Patna University. He took his M.B.B.S. degree from Patna Medical College and qualified for D.T.M. & H. from London. He was in service for some years. Later he started private practice at Lakhisarai. Due to ill health, however, he left Lakhisarai in 1968, for Calcutta where he settled down to lead a restful life.



DR. B. B. BOSE

Dr. Bose was a member of I.M.A., Patna Branch, for many years and was an active member of Dhakuria Branch till his death.

He leaves behind his wife, three sons and two daughters.

Dr. Ram Shankar Nanda

Son of an eminent physician, Dr. Ram Shankar Nanda was born in Burma in 1900. He graduated in medicine from Calcutta Medical College in 1927 and started private practice at Contai in the Midnapore district of West Bengal. For his skill in both medicine and surgery and his devotion to the profession, he was widely respected.

DR. R. S. NANDA

Dr. Nanda was a founder of I.M.A., Contai Branch and was also its President for a term.

Being a staunch nationalist since his student days Dr. Nanda took part in the Swadeshi movement on several occasions in the pre-Independence period and also organised medical relief for the people who suffered injuries in the wake of police repression on such movements. Once in 1930 he was arrested from his chamber while examining patients and was sentenced to undergo 6 months' rigorous imprisonment. He was kept confined in a condemned cell at the Midnapore Central Jail for a period, before he was released.

He had been suffering from liver troubles for a long time and died at the S.S.K.M. Hospital, Calcutta, on 21-4-73.

CORRIGENDA

Vol. 60, No. 4, February 16, 1973 Issue.

Ref. Practitioners' Series, "Cephaloridine in Acute ENT Infection," p. 127-129—please read cephalexin in place of cephaloridin.

Vol. 60, No. 6, March 16, 1973 Issue, page 200

Ref. Originals and Papers (4) "Relapsing Peripheral Neuropathy in Association with Renal Carcinoma"—the date of Receipt for Publication which is 8-11-1971 was inadvertently omitted.

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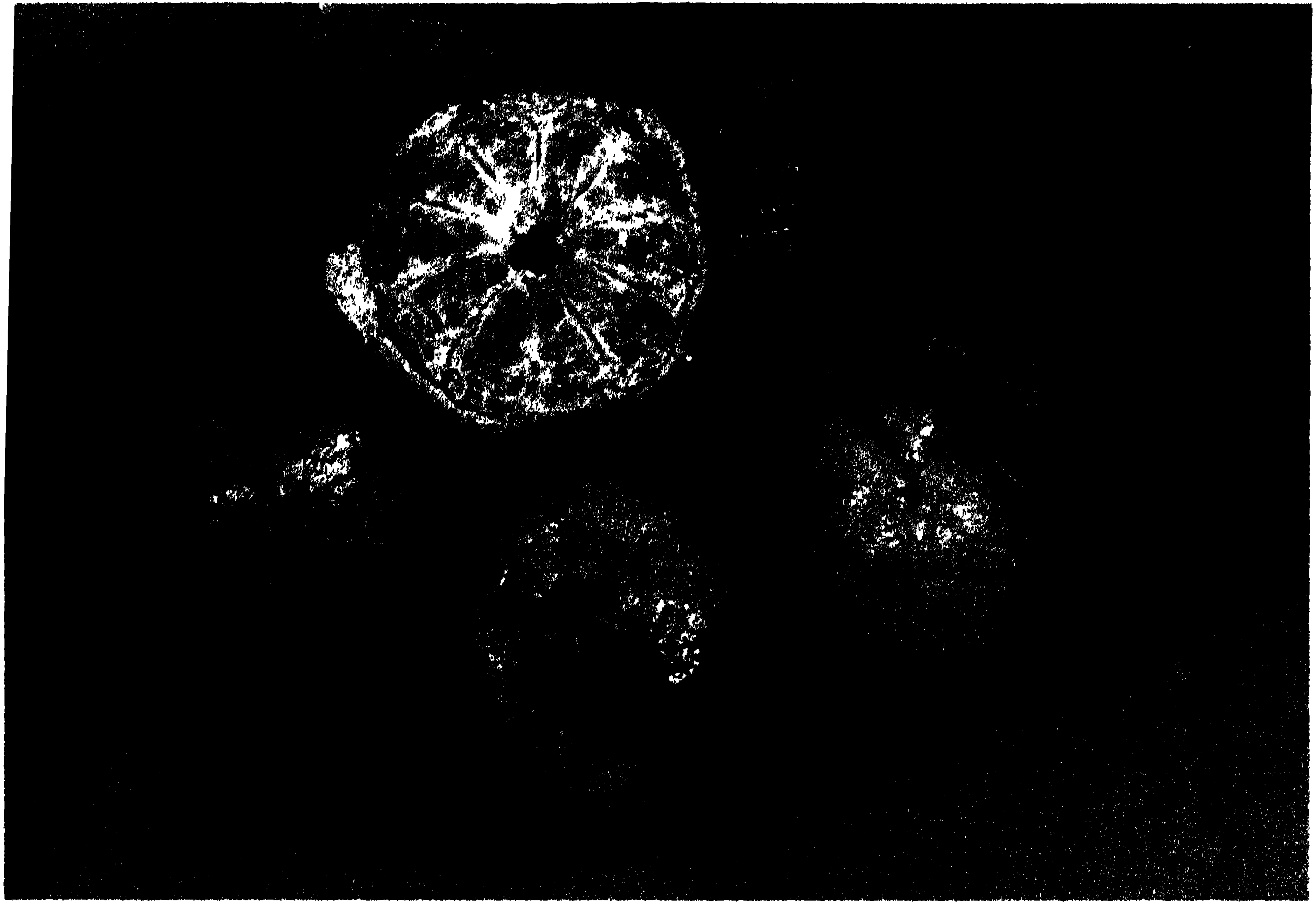

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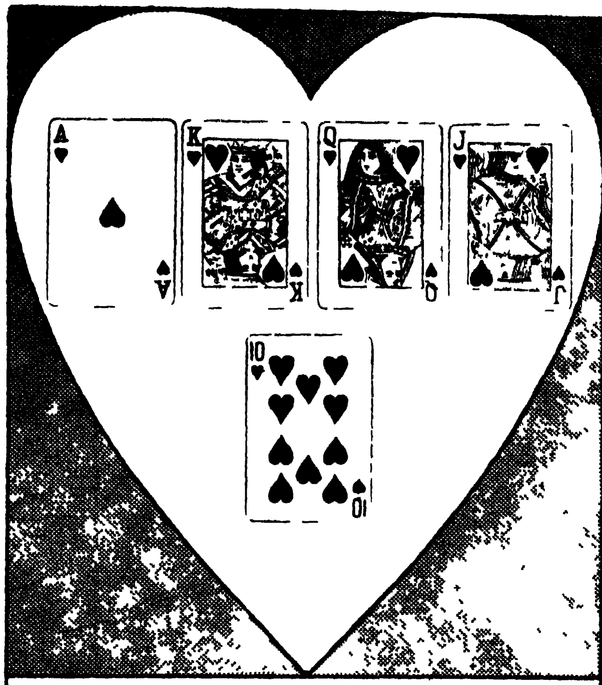

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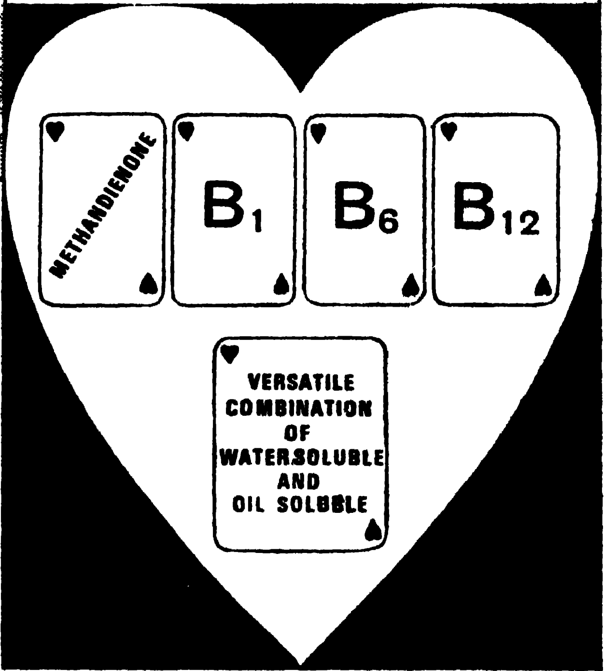
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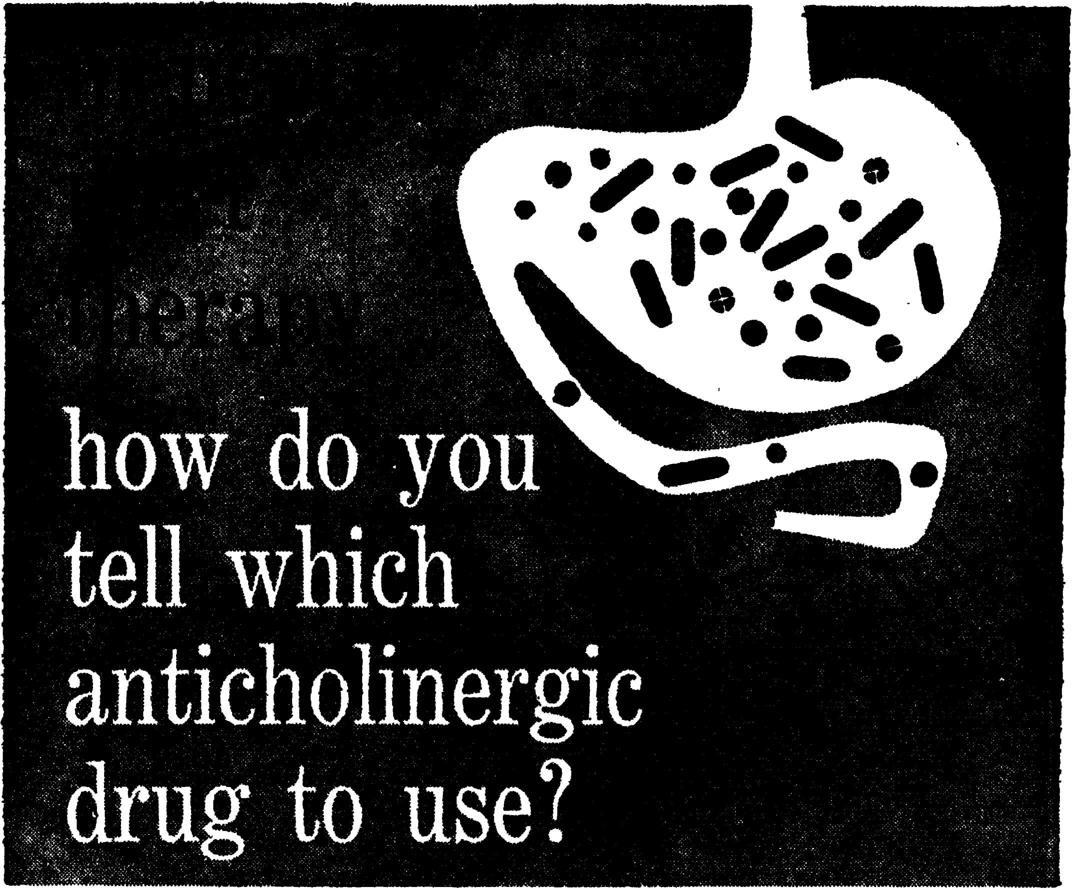

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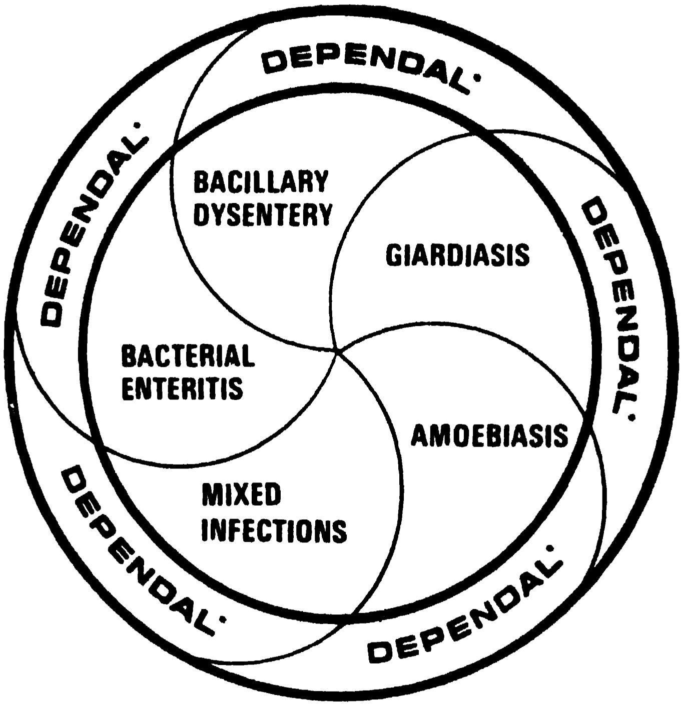

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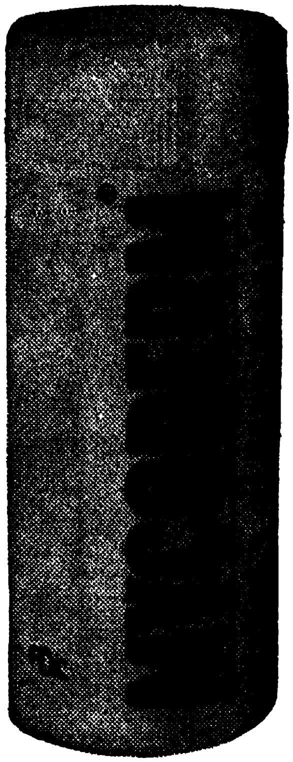

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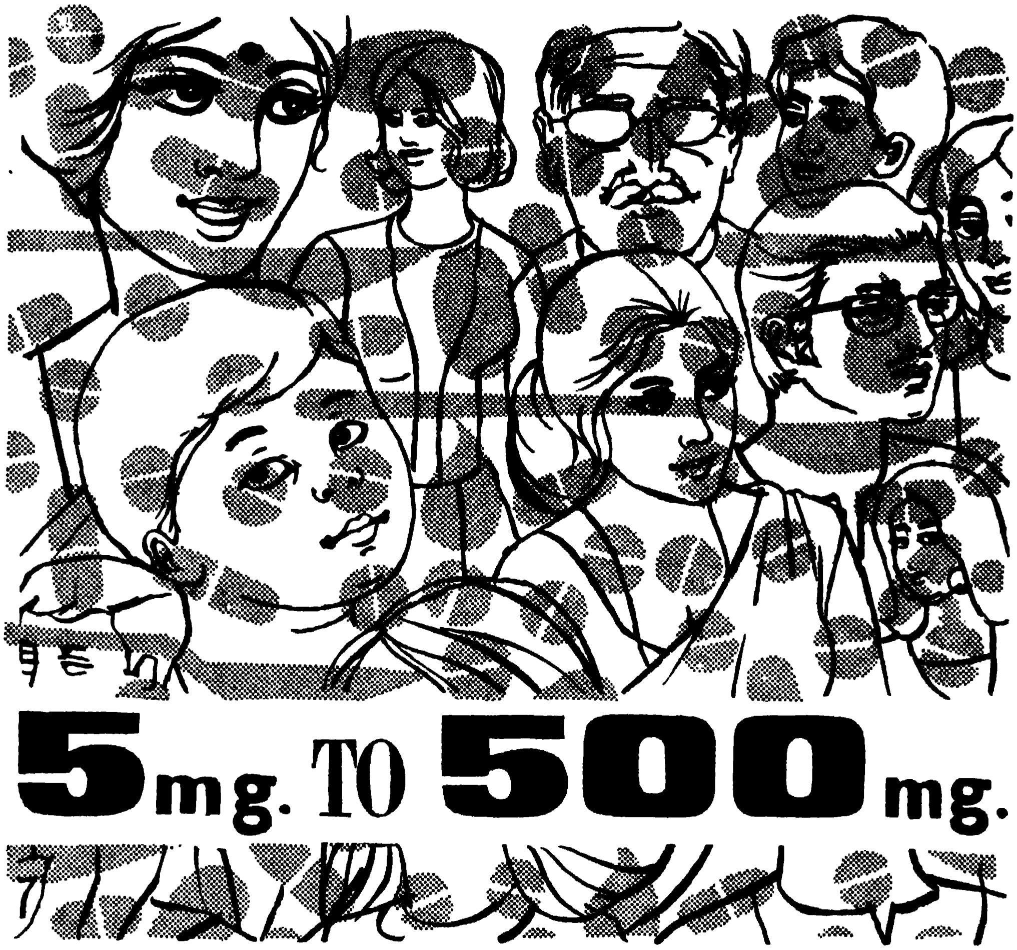
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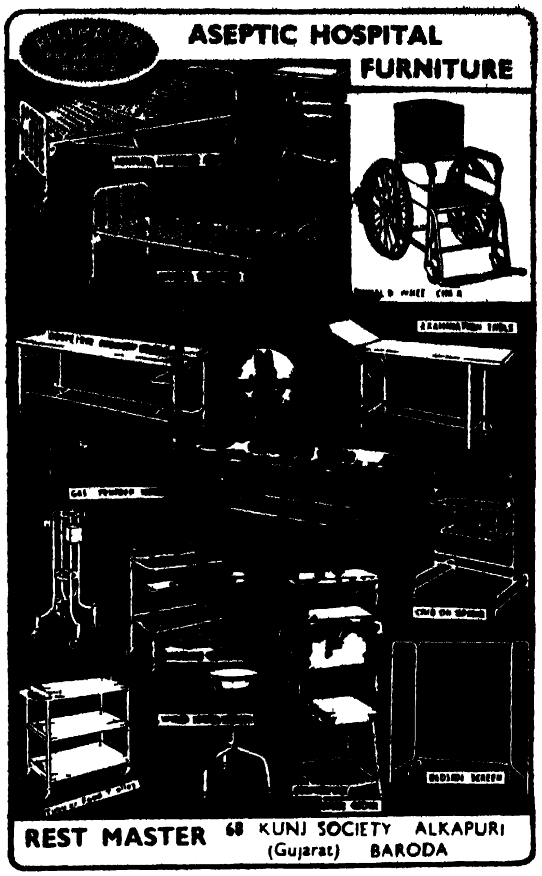

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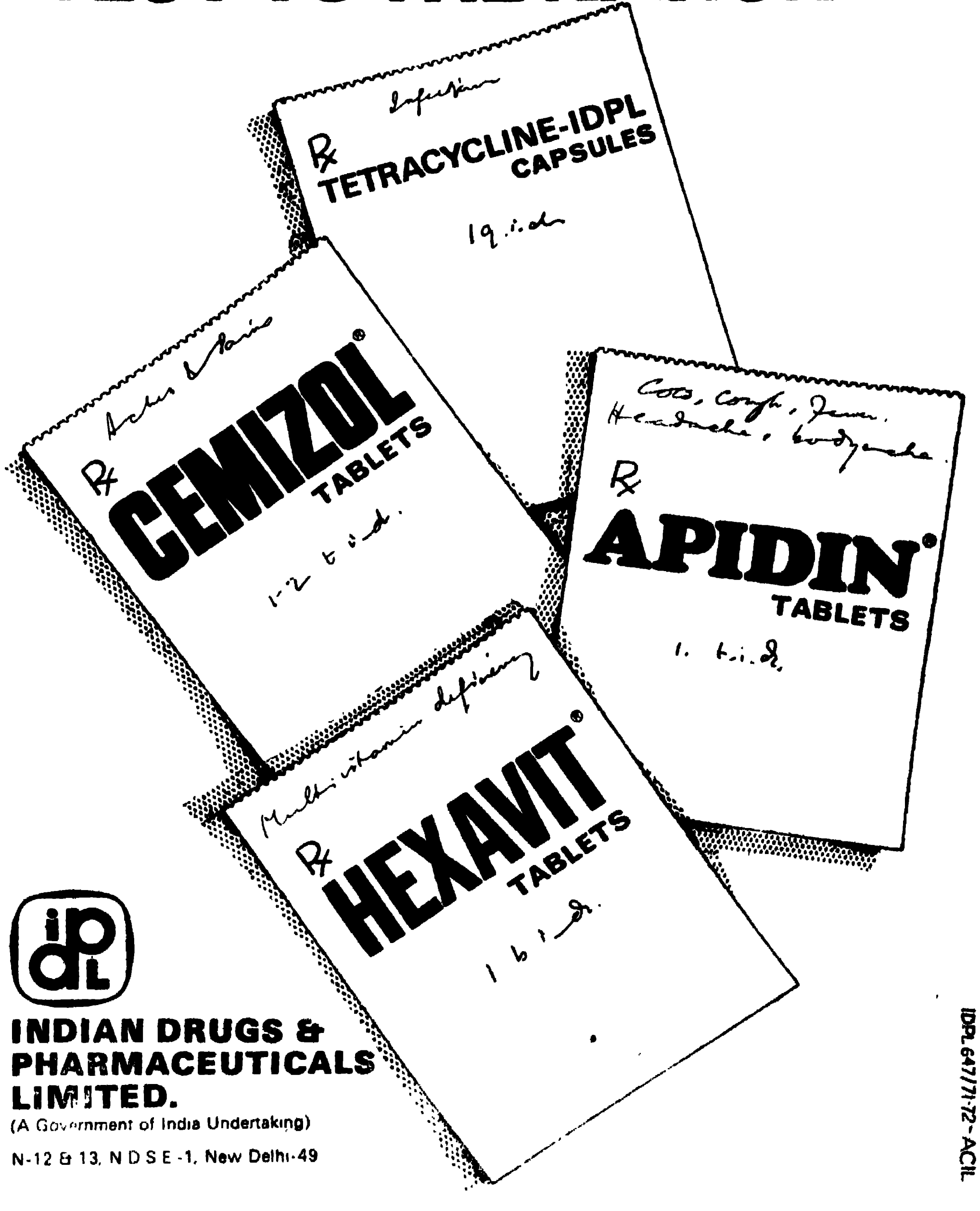

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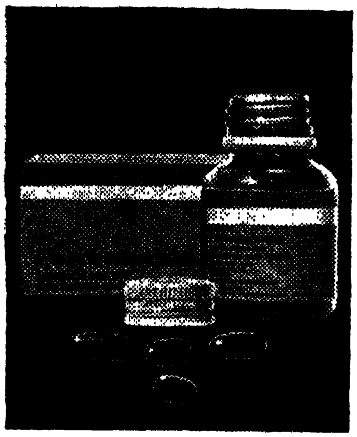

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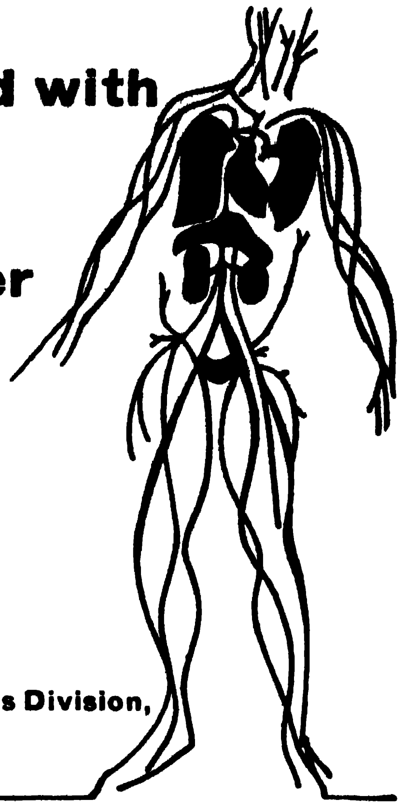

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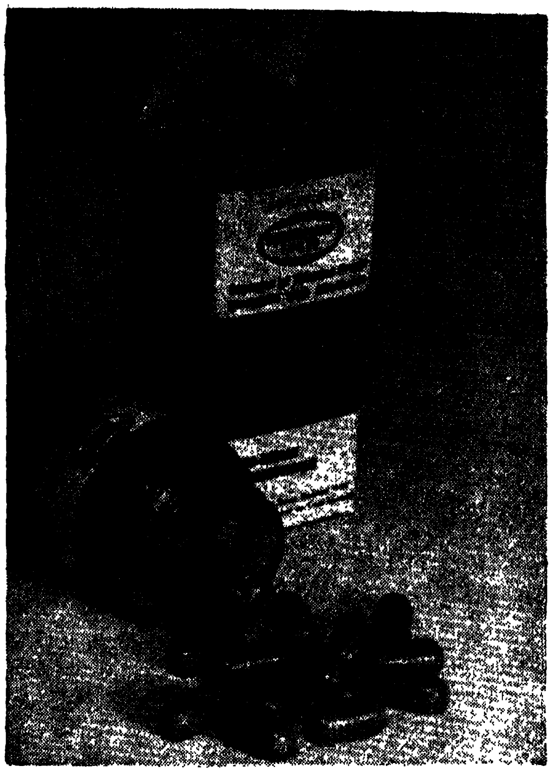

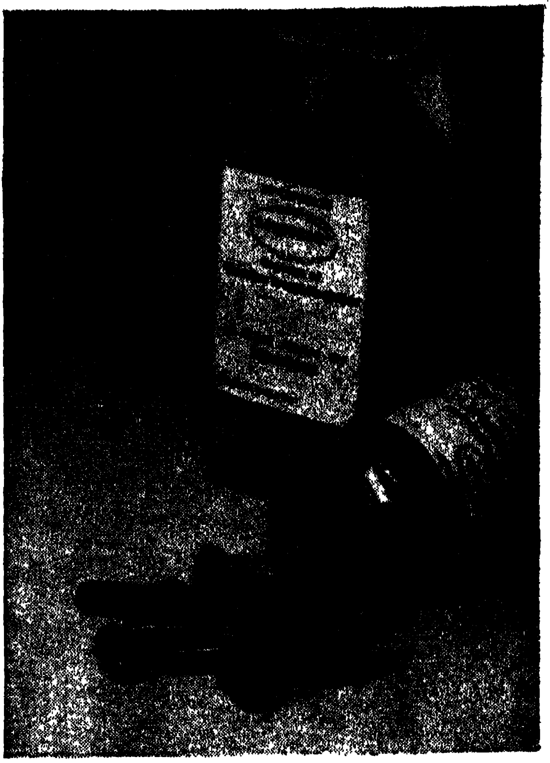

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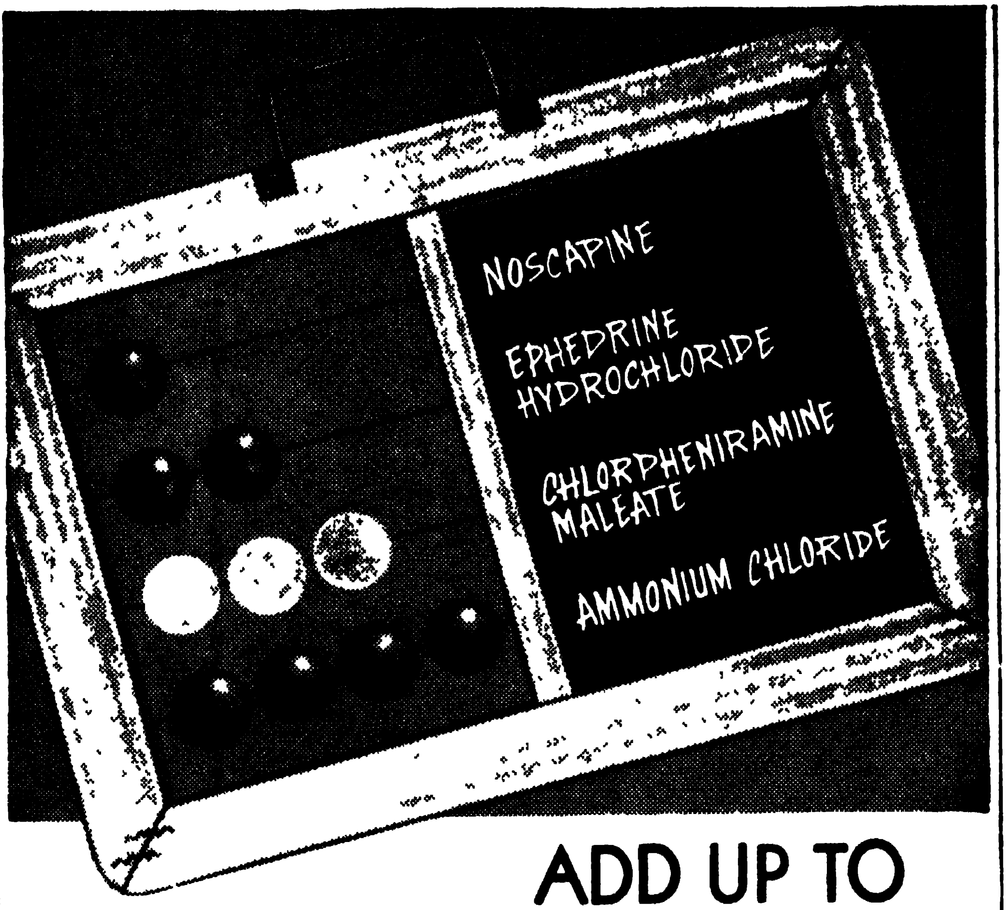

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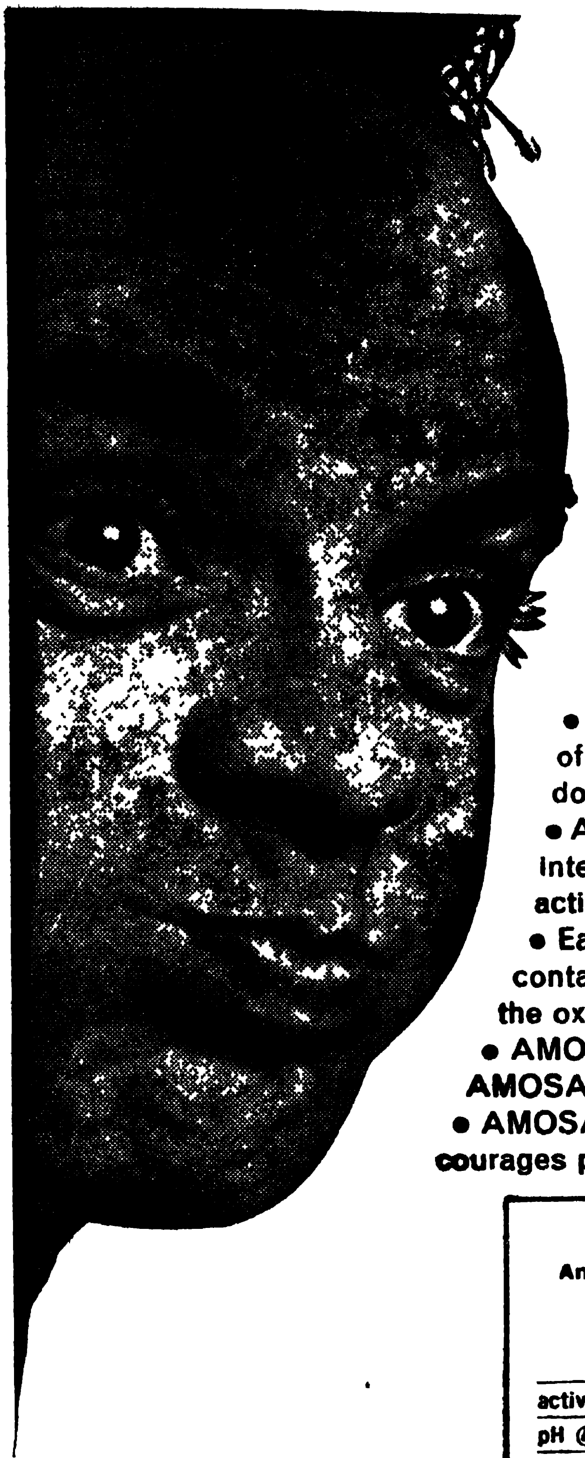

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References. 1. Wade, A.B.: The Dent. Practitioner 14:185 (Jan.) 1964. 2. Smith, J. F. et al: Dent. Survery 45:33 (Nov.) 1969. 3. Rise, E. et al: Arch. Otolaryng. 90:135 (Oct.) 1969.

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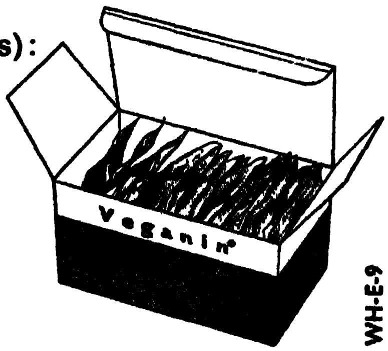

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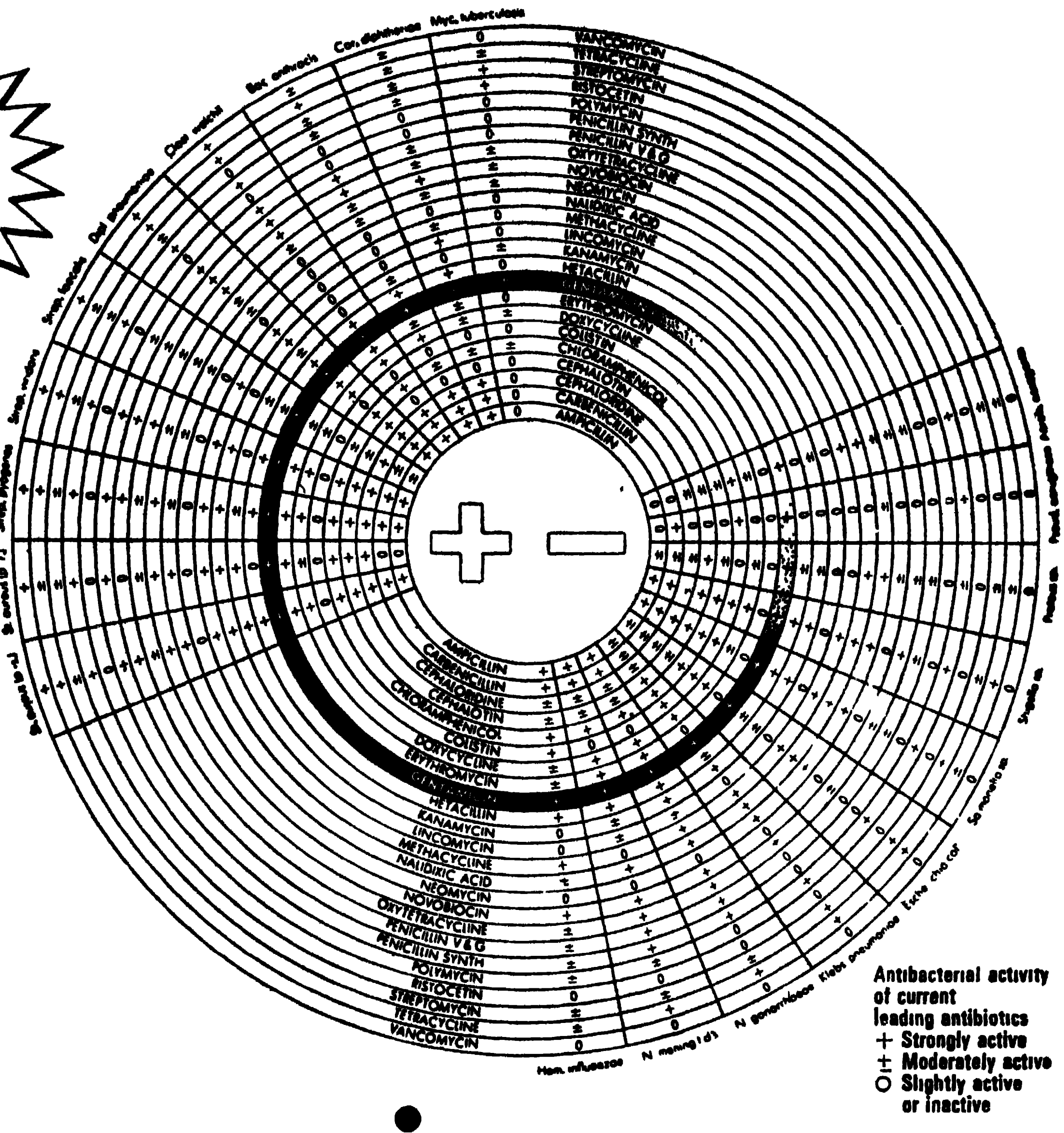

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CALCUTTA
MARCH 1, 1973

ORIGINALS AND PAPERS

1

Enzymic Studies in Surgical Jaundice

K. S. KOCHHAR*, VED PARKASH**, K. S. SACHDEV***
GURDAS SINGH****

[*Received for publication November 14, 1970*]

LaDue *et al.* (1954) for the first time stressed the importance of the estimation of serum glutamic oxaloacetic transaminase (SGOT) and serum glutamic pyruvic transaminase (SGPT) in clinical medicine. Karmen *et al.* (1955) found the use of these enzymes in patients suffering from myocardial infarction and jaundice with acute liver disease. Wroblewski and Cabaud (1957) reported the activity of these enzymes in acute liver cell injury.

Sommerville *et al.* (1960) also found the usefulness of these enzymic estimations in obstructive jaundice. The aim of the present study is to evaluate these enzymic levels in cases of obstructive jaundice before and after the operation when the obstruction is relieved by various operative measures.

MATERIAL AND METHOD

A total number of 100 persons formed the material for the present study. They were grouped as follows :

Normal persons—75 e.g., 75 per cent of the total and cases of extrahepatic biliary obstruction—25 e.g., 25 per cent of the total.

For standardisation of the technique and the results, 75 normal persons were studied for serum transaminases. They included persons of different ages varying from 18 to 70 years and from both sexes. This group included medical students, members of the hospital and laboratory staff. All of them were medically checked up and found to be normal healthy subjects, free from all such diseases that might have directly or indirectly influenced the value of these enzymes. Twenty-five patients suffering from obstructive jaundice were admitted in the surgical wards of the Victoria Jubilee Hospital, Amritsar. Only those cases were selected for study who had evidence of extrahepatic biliary obstruction. Blood samples for biochemical investigations were collected in a clean dry test tube after venepuncture. Serum was separated by centrifugation at 1500 r.p.m. for 15 minutes. Any haemolysed sample was discarded. All estimations were carried out on the same day.

The following estimations were carried out :

1) Serum bilirubin was estimated according to the method of Harrison (1957), 2) serum alkaline phosphatase was estimated by the technique of King and Armstrong described by King and Wootten (1959) and 3) serum transaminases, both SGOT and SGPT, as described by Singh and Singh (1962) based on the principle described by Yatzidis (1960).

RESULTS

Seventy-five apparently healthy normal individuals from both sexes and of different age

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groups were investigated for the assay of SGOT and SGPT activity. The values obtained in these individuals for serum SGOT and SGPT activity in relation to age are shown in Tables 1 and 2.

The results of serum SGOT and SGPT activity with regards to sex are given in Tables 3 and 4.

Twenty-five cases of extrahepatic obstructive jaundice could be grouped as follows:

1) Patients with stone in common bile duct 18 e.g., 72 per cent, 2) patients with carcinoma of the head of the pancreas 6 e.g., 24 per cent and 3) patients with ampullary carcinoma 1 e.g., 4 per cent.

The age and sex scatter of these 25 patients is given in Table 5.

Table 1—*Showing SGOT Values in Relation to Age in 75 Normal Individuals*

Age (in years)	No. of cases (% of total)	Range units/ml.	Mean units/ml.	S.D. ±	S.E. ±
Below 20	14 (18.66)	17-88	38.75	20.33	5.97
21-30	19 (25.33)	25-98	57.32	22.73	5.21
31-40	15 (20.00)	22-99	53.66	26.35	6.80
41-50	13 (17.33)	25-88	45.62	18.12	5.02
51-60	10 (13.33)	24-95	56.70	24.44	7.72
61-70	4 (5.33)	36-80	59.00	19.00	9.50
18-70	75 (100)	17-99	52.8	23.51	2.73

Table 2—*Showing SGPT Values in Relation to Age in 75 Normal Individuals*

Age (in years)	No. of cases (% of total)	Range units/ml.	Mean units/ml.	S.D. ±	S.E. ±
Below 20	14 (18.66)	24-82	37.93	15.73	4.31
21-30	19 (25.33)	22-90	51.47	22.15	5.08
31-40	15 (20.0)	25-84	47.26	17.26	4.48
41-50	13 (17.33)	24-90	46.38	20.40	5.65
51-60	10 (13.33)	24-98	48.04	18.37	5.81
61-70	4 (5.33)	34-70	47.51	13.67	6.83
18-70	75 (100)	22-95	46.87	20.27	2.36

Table 3—*Showing Normal SGOT Activity in Relation to Sex*

Sex	No. of cases (%)	Range units/ml.	Mean units/ml.	S.D. ±	S.E. ±
Males	48 (64)	17-99	52.71	24.72	3.57
Females	27 (36)	22-99	52.41	23.51	4.52

Table 4—*Showing Normal SGPT Activity in Relation to Sex*

Sex	No. of cases (%)	Range units/ml.	Mean units/ml.	S.D. ±	S.E. ±
Males	48 (64)	22-96	47.00	19.84	2.86
Females	27 (36)	24-88	46.66	20.83	4.00

Table 5—*Showing Age and Sex Incidence in 25 Patients with Obstructive Jaundice*

Cause of obstruction	No. of cases	Sex		Age group	Mortality
		Male	Female		
Stones	18	5	13	32-50	Nil
Carcinoma	7	5	2	44-52	3

Serum bilirubin, serum enzymes namely SGOT, SGPT and alkaline phosphatase levels were estimated a few days before the operation, on the morning of operation and following operation on the 3rd, 7th and 10th postoperative day and on the day of discharge of the patient from hospital or death. All the patients were operated upon for malignant obstruction, either cholecystostomy or cholecystojejunostomy was performed and for non-malignant obstruction the causative stone was removed and the common bile duct drained.

Table 6 shows the serum bilirubin level in 25 cases of obstructive jaundice.

The pre-operative serum bilirubin levels ranged from 4 to 32 mg. per cent with a mean of 12.2 mg. per cent. The maximum value of 32 mg. per cent was seen in a case of carcinoma of the head of the pancreas. The pre-operative levels were much higher in malignant obstruction.

The serum bilirubin level declined following the operation in all the patients. There was no difference in the rate of decline in the malignant and non-malignant jaundice. One patient (case 5) showed a rise in the level following the operation till death. The patient went into cholaemia and died on the 7th postoperative day. In 5 cases the bilirubin level remained elevated (more than 3 mg. per cent) at the time of discharge from the hospital, although, all these cases (7, 10, 15, 19 and 24) showed a progressive decline in their serum bilirubin level.

Table 7 shows the serum alkaline phosphatase levels in these 25 cases of obstructive jaundice.

The pre-operative alkaline phosphatase levels varied from 18 to 72 K.A. units/100 ml. with a mean of 31.88 units. The highest value of 72 K.A. units was observed in cases of malignant obstruction. After relief of obstruction the serum alkaline phosphatase levels gradually came down below 14.2 K.A. units except in one case (case 19) where the value remained at 22.0 units. The trend of decline in the alkaline phosphatase activity following the operation was similar in cases with malignant and non-malignant obstruction. In the three patients who expired, the phosphatase levels were significantly high at the time of death.

The pre-operative and postoperative SGOT activity in 25 cases of obstructive jaundice is given in Table 8.

Table 6—*Showing Serum Bilirubin Levels in mg. per cent in Pre-operative and Postoperative Patients*

Case No.	Cause of obstruction	Pre-operative levels	Postoperative levels (days)			
			3rd	7th	10th	Day of discharge or death
1	Stones	8 0	6.0	4.0	—	2.4 (18th)
2	Stones	4 0	3.2	2.2	—	1.0 (15th)
3	Stones	12.0	8.0	7.0	3.2	1.0 (17th)
4	Stones	4.8	2.0	2 0	—	1.2 (15th)
5	Carcinoma of head of pancreas	8.2	11.8	—	—	10.0 (7th)*
6	Stones	7.2	5.8	4.0	3.0	2.2 (13th)
7	Stones	14.2	8.0	7.2	5.2	4.2 (19th)
8	Stones	9.5	6.0	2.0	0.5	0.5 (27th)
9	Carcinoma of head of pancreas	20.0	13.8	12.0	—	13.0 (13th)*
10	Stones	16.5	15.2	10.0	4.8	4.0 (17th)
11	Carcinoma of head of pancreas	17.2	16.0	15.2	14.6	18 4 (28th)*
12	Stones	10.0	9.0	5.2	3.2	2.0 (10th)
13	Stones	6.0	4.2	4.2	1.0	0.5 (25th)
14	Carcinoma of head of pancreas	4.8	4.0	3.2	1.0	0.5 (35th)
15	Carcinoma of head of pancreas	24.0	21.0	20.0	8.2	3.8 (52nd)
16	Stones	9.8	7.2	4.0	4.0	1.0 (38th)
17	Stones	5.6	2.4	1 2	1.2	0.6 (15th)
18	Stones	8.8	8.0	4.0	2.0	1.0 (20th)
19	Carcinoma of head of pancreas	32.0	28.0	24.2	24.8	27.8 (60th)
20	Stones	6.4	4.0	2.2	0.8	0.8 (25th)
21	Stones	8.4	5.2	3.0	2.6	2.0 (13th)
22	Stones	15.2	11.2	8.0	5.8	1.6 (25th)
23	Stones	15.0	9.2	5.2	4.0	2.8 (30th)
24	Carcinoma of head of pancreas	22.0	19.2	16.4	13.8	5.8 (39th)
25	Stones	12.0	8.2	3.4	3.0	2.4 (15th)

* Expired

Table 7—*Showing Serum Alkaline Phosphatase Values in K. A. Units/100 ml. in Cases with Obstructive Jaundice*

Case No.	Cause of obstruction	Pre-operative levels	Postoperative levels (days)			
			3rd	7th	10th	Day of discharge or death
1	Stones	26	24	18	—	13 (18th)
2	Stones	32	28	16	—	11 (15th)
3	Stones	18	17	11	8	8 (17th)
4	Stones	24	17	14	—	12 (15th)
5	Carcinoma of head of pancreas	35	32	—	—	30 (7th)*
6	Stones	34	33	23	13	8 (13th)
7	Stones	28	22	20	10	8 (19th)
8	Stones	18	16	10	4	6 (27th)
9	Carcinoma of head of pancreas	60	51	36	—	34 (13th)*
10	Stones	27	17	16	13	10 (17th)
11	Carcinoma of head of pancreas	37	36	27	23	20 (13th)*
12	Stones	24	23	15	10	10 (10th)
13	Stones	31	28	22	15	9 (25th)
14	Carcinoma of head of pancreas	32	28	26	24	14 (35th)
15	Carcinoma of head of pancreas	40	34	26	14	14 (52nd)
16	Stones	28	15	6	—	5 (38th)
17	Stones	28	24	12	10	9 (15th)
18	Stones	28	21	13	11	10 (20th)
19	Carcinoma of head of pancreas	72	70	64	56	22 (60th)
20	Stones	34	28	20	13	12 (25th)
21	Stones	30	27	24	16	13 (18th)
22	Stones	33	29	16	13	10 (15th)
23	Stones	36	31	27	22	12 (30th)
24	Carcinoma of head of pancreas	40	31	26	19	14 (39th)
25	Stones	26	20	16	14	12 (15th)

* Expired

Table 8—*Showing Pre-operative and Postoperative SGOT Values in Units per/ml. in 25 Cases with Obstructive Jaundice*

Case No.	Cause of obstruction	Pre-operative levels	Postoperative levels (days)			
			3rd	7th	10th	Day of discharge or death
1	Stones	490	400	230	—	90 (19th)
2	Stones	460	342	296	—	48 (15th)
3	Stones	520	520	544	362	110 (17th)
4	Stones	290	244	112	—	60 (15th)
5	Carcinoma of head of pancreas	760	880	—	—	1108 (7th)*
6	Stones	150	124	96	64	34 (13th)
7	Stones	464	332	280	190	88 (19th)
8	Stones	232	210	116	48	32 (27th)
9	Carcinoma of head of pancreas	708	664	520	—	980 (13th)*
10	Stones	348	330	176	132	88 (17th)
11	Carcinoma of head of pancreas	460	370	280	254	902 (28th)*
12	Stones	340	340	298	108	48 (10th)
13	Stones	208	208	264	280	48 (25th)
14	Carcinoma of head of pancreas	401	350	326	264	96 (35th)
15	Carcinoma of head of pancreas	844	740	732	600	60 (52nd)
16	Stones	960	722	564	—	400 (18th)
17	Stones	420	324	268	240	64 (15th)
18	Stones	198	188	280	452	96 (20th)
19	Carcinoma of head of pancreas	614	580	542	724	180 (20th)
20	Stones	456	460	384	64	44 (25th)
21	Stones	372	260	164	160	64 (13th)
22	Stones	408	316	234	160	72 (15th)
23	Stones	268	192	174	168	140 (30th)
24	Carcinoma of head of pancreas	472	460	324	248	88 (19th)
25	Stones	312	292	136	102	56 (15th)

* Expired

All the 25 cases of obstructive jaundice revealed a raised SGOT activity, the rise being two to seven fold taking the upper limit of 100 units/ml. values as found in the present series of normal individuals. The pre-operative values were found to be 160-960 units/ml. with a mean of 438.6 units/ml. Further, the mean values were different in cases with carcinoma of the pancreas from those with common bile duct stones. In the former, the levels ranged between 460 and 844 units/ml. with a mean value of 642 units whereas in the latter, the range was 160 to 960 units with a mean of 396 units/ml.

The SGOT levels declined following the release of obstruction to the biliary passage. The decline was similar in malignant and non-malignant obstruction, except in three cases of carcinoma of the head of pancreas where values went up just before death. These patients died in the postperative period on the 7th, 13th and 28th postoperative day respectively. Their respective SGOT levels were 760 units, 708 units and 480 units/ml. on the day they expired.

Table 9 shows the SGPT activity before and after the operation in 25 cases of obstructive jaundice.

The SGPT values varied from 216 to 972 units/ml. with a mean of 480 units in these 25 patients of obstructive jaundice. These figures are much higher than the upper limit in the normal series as 92 units/ml. The SGPT levels declined following the release of obstruction to the biliary passage. Again, the decline was similar in patients with malignant and non-malignant obstruction except in 3 cases of carcinoma of the head of pancreas where the values went up just before death. The patients (cases 3, 13, 18 and 19) who developed postoperative temperature also recorded a rise in SGPT levels during that period, but whereas the pre-operative SGPT levels were higher than the SGOT levels, the SGPT activity during febrile phase was less than the SGOT rise. The three patients who died in the postoperative period had a rise in the SGPT activity immediately before death, but in two of these the SGOT levels were higher than SGPT levels

DISCUSSION

There has been a growing emphasis on the study of SGOT and SGPT both in the diagnosis and prognosis of a large number of pathological

Table 9—*Showing SGPT Values in Units/ml in Cases with Obstructive Jaundice*

Case No.	Cause of obstruction	Pre-operative levels	Postoperative levels (days) 3rd	7th	10th	Day of discharge or death
1	Stones	450	390	330	—	98 (18th)
2	Stones	476	420	268	—	72 (15th)
3	Stones	640	476	420	500	84 (17th)
4	Stones	310	336	234	—	78 (15th)
5	Carcinoma of head of pancreas	780	812	—	—	978 (7th)*
6	Stones	220	160	102	96	36 (13th)
7	Stones	508	468	360	124	80 (19th)
8	Stones	354	296	296	164	80 (27th)
9	Carcinoma of head of pancreas	664	588	476	—	940 (13th)*
10	Stones	464	383	364	248	110 (17th)
11	Carcinoma of head of pancreas	638	630	540	412	980 (28th)*
12	Stones	380	318	208	150	64 (10th)
13	Stones	242	260	288	250	64 (25th)
14	Carcinoma of head of pancreas	376	330	236	156	48 (25th)
15	Carcinoma of head of pancreas	942	890	860	688	200 (52nd)
16	Stones	908	564	420	420	258 (38th)
17	Stones	508	344	250	116	40 (15th)
18	Stones	244	168	208	380	64 (25th)
19	Carcinoma of head of pancreas	596	564	740	624	220 (20th)
20	Stones	456	460	384	64	44 (60th)
21	Stones	444	348	230	120	88 (25th)
22	Stones	458	370	324	260	88 (13th)
23	Stones	310	268	168	156	80 (15th)
24	Carcinoma of head of pancreas	568	508	472	334	39 (39th)
25	Stones	356	300	262	186	88 (15th)

* Expired

conditions particularly those of the heart and liver. A large number of methods have been described and the normal values obtained are given in Tables 10 and 11.

Normal subjects—Seventy-five normal subjects of both the sexes and of the age ranging from 18 to 70 years showed the SGOT values of 17-99 units per ml. with a mean value of 52.8 units/ml. and with a standard deviation of ± 23.5. The normal SGPT values ranged from 22 to 95 units/ml. with a mean of 46.87 units/ml. having a standard deviation of ± 20.27. The values are in agreement with those of Yatzidis (*loc. cit.*) and Singh and Singh (*loc. cit.*). The latter reported normal SGOT levels ranging from 10 to 100 units/ml. in 61 normal individuals. These values are grossly different from those reported by other workers as is apparent from Table 10. Further, these variations strongly indicate the need of a universally accepted standard and an accurate technique. The values of SGOT and SGPT exceeding 100 units/ml. are considered as abnormal. The age and sex do not bear any relation with the range and the mean values. These finding are in agreement with those of Steinberg *et al.* (1956) and Chinsky *et al.* (*loc. cit.*). Baron *et al.* (*loc. cit.*) failed to record any change in the transaminase activity due to meals, exercise and diurnal variation.

Extrahepatic obstructive jaundice—Preoperative SGOT and SGPT levels were consistently raised in all the 25 patients of obstructive jaundice. In none of these 25 cases the SGOT and SGPT values were below 100 units/ml., the upper normal limit of the present series. With the exception of case 16 who had a superadded cholangitis, the rise in both SGOT and SGPT was less than 10 fold of the upper normal limit, the average increase being 2·7 fold. This finding is in agreement with the observations of Chinsky *et al.* (1956), Mossberg *et al.* (1962), Zimmerman (1964) and Aronsen (1961).

SGOT levels were much higher in cases of pancreatic carcinoma causing obstruction (mean value of 642 units per ml.) as compared to calculus obstruction (mean value of 396 units/ml.). In four of the 7 cases of carcinoma pancreas the SGOT levels were more than 600 units/ml., while only one of the 18 cases with calculus obstruction had SGOT value higher than 600 units/ml. This patient had superadded cholangitis at the time of SGOT estimation. Therefore, SGOT levels higher than 6 times the upper normal value may be suggestive of malignant obstruction provided the obstructive jaundice is not associated with cholangitis. SGPT levels have also been constantly raised in all cases of obstructive jaundice and the rise has been much

Table 10—*Showing Normal Values of SGOT Reported in the Literature*

Authors	Technique	No. of cases	SGOT activity		
			Range	Mean	S.D. ±
Karmen *et al.* (1955)	Spectrophotometric	50	9-32	19.6	—
Wroblewski and LaDue (1955)	Spectrophotometric	500	5-40	22	7
Chinsky *et al.* (1956)	Spectrophotometric	15	7-40	20	8
Carbaud *et al.* (1956)	Colorimetric	35	4-40	16.4	8.4
Reitman and Frankel (1957)	Colorimetric	72	8-40	—	4.9
Baron *et al.* (1956)	Spectrophotometric	25	8-25	16	5.5
Pryse-Davies and Wilkinson (1958)	Spectrophotometric	50	11-38	19	6
Vanikar *et al.* (1959)	Colorimetric	25	0-26	11.6	—
Yatizidis (1960)	Colorimetric	50	15-98	—	—
Singh and Singh (1962)	Colorimetric	61	10-100	60	20
Present Study (1965)	Colorimetric	75	17-99	52.8	23.5

Table 11—*Showing the Normal Values of SGPT Reported in Literature*

Authors	Technique	No. of cases	SGPT activity		
			Range	Mean	S.D. ±
Wroblewski and LaDue (1956)	Spectrophotometric	260	5-35	16	9.0
Wroblewski (1957)	Colorimetric	50	1-45	22	11.5
Reitman and Frankel (1957)	Colorimetric	22	5-30	—	3.7
Pryse-Davies and Wilkinson (1958)	Spectrophotometric	50	7-26	16	5.0
Vanikar *et al.* (1959)	Colorimetric	25	0-30	11	—
Yatizidis (1960)	Colorimetric	50	26-92	46.8	20.2

more in malignant obstruction cases The SGPT rise pattern has been similar to that of SGOT; in 16 patients the SGPT value was higher than that of SGOT, while in 7 patients SGOT value was higher than that of SGPT In two patients with obstructive jaundice associated with cholangitis both SGOT and SGPT values were very high, in one case (case 7) SGPT was higher than SGOT and in the second case (case 6) SGOT was higher than SGPT value

Our findings that the ratio of SGPT/SGOT =422/380 for calculus obstruction and 680/645 for malignant obstruction are in accord with the observation of Kove *et al* (1958); Rosalki (1960), Pryse-Davies and Wilkinson (*loc cit*) and Vanikar *et al* (*loc cit*) From these observations it may be concluded that the estimation of SGPT is not superior to that of SGOT as an aid in the diagnosis and prognosis of obstructive jaundice, as both the transaminases show a similar pattern of elevation However Wroblewski and LaDue (1956) and Wroblewski (1957) reported that SGPT is usually higher than SGOT value Chinsky *et al* (1957) observed that SGPT activity was useful in exclusion of hepatic necrosis and it was a more sensitive index of acute liver damage than SGOT This observation may be true for infective hepatitis but not for obstructive jaundice because in the present study, there has been no significant difference in the preoperative pattern of SGOT and SGPT activity

Cholangitis – Serum transaminases in obstructive jaundice associated with cholangitis was observed in two cases (cases 7 and 16) of obstructive jaundice with superadded cholangitis Case 16 had the highest transaminase levels both for SGOT (1182 units/ml) and for SGPT (1040 units/ml) When the inflammation subsided and the temperature came down the serum transaminase activity also decreased These are the patients who can be clinically confused with infective hepatitis In such cases serum transaminase estimations fail to help in the differentiation because the serum enzyme values are high in both types of jaundice As cholangitis is always accompanied by some necrosis of the liver parenchyma, this explains the high levels of transaminases in jaundice associated with cholangitis (Fig. 1).

In 4 patients who developed temperature in the postoperative period, serum transaminase activity recorded a synchronous rise and when the patient's condition improved with fever settling down, the enzyme activity was also noted to have fallen down considerably (Fig. 2).

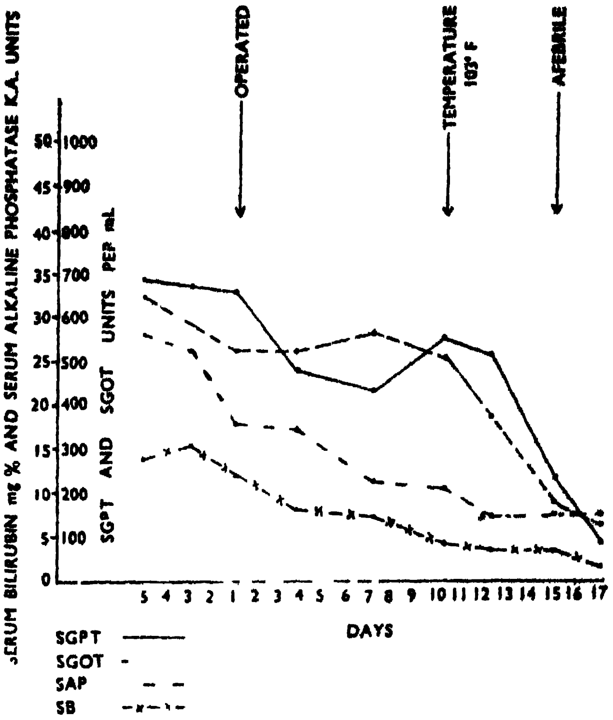


Fig 1

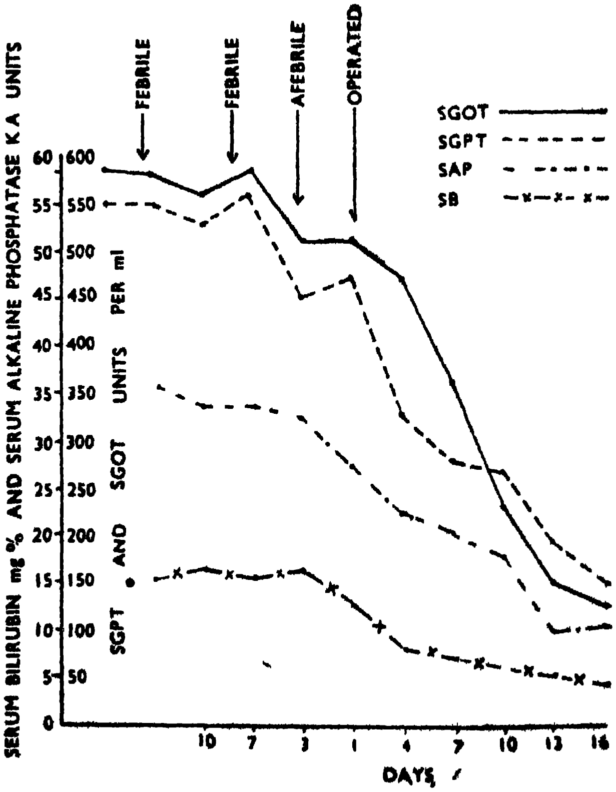


Fig. 2

Postoperative period—Following operation and relief of obstruction to the flow of bile from the liver the serum transaminase levels started declining progressively. The fall, however, was not uniform, being rapid in the immediate postoperative period but gradual later on. In 15 out of 18 patients with calculus obstruction, the levels of serum enzymes had come down to normal at the time of discharge, within 20 days in 14 patients and on the 25th day in the 15th patient. In three patients, however, the postoperative values were still higher than normal on the 17th day (case 3), 38th day (case 16) and 30th day (case 23). In two of these, the SGOT values were only slightly higher than 110 and 140 units/ml. In the third patient, SGOT was 400 units per/ml. on the 38th postoperative day. This patient had cholangitis and the pre-operative SGOT level was the highest.

SGOT activity took a long time to return to normal in cases of carcinoma of pancreas, 35, 39 and 52 days in three patients. In the 4th surviving patient, SGOT value was still 180 units/ml. on the 60th day. In three patients with pancreatic carcinoma who died after operation, the SGOT level though declining after the operation, recorded a steep rise before death and the activity was much higher than immediate postoperative levels.

SGPT levels followed similar pattern and there was no significant difference in the rates of the two, although pre-operative SGPT values were higher than SGOT. Aronsen (*loc. cit.*) observed in the experimental animals and Wroblewski and LaDue (1956) observed that the transaminase activity fell to normal within 7-14 days after the relief of obstruction caused either by calculus or by pancreatic carcinoma.

Interrelationship—The high values of serum bilirubin, alkaline phosphatase and transaminases were observed in all the cases in pre operative conditions (Tables 6, 7, 8 and 9).

In most of the cases there was a disproportionate rise in these levels as no correlation could be established between any of the parameters. These observations are in agreement with the results of Puri *et al.* (1962) and Joglekar (1962).

Levels of serum bilirubin, serum alkaline phosphatase, and transaminases were all much more elevated in cases of pancreatic carcinoma than in cases with calculus obstruction (Fig. 3). The pattern of decline following operations and relief of obstruction has been more or less similar for various laboratory tests. The SGOT and SGPT curves, however, recorded a rise after decline in the immediate postoperative period in patients with malignant obstruction. While the SGOT and SGPT levels rose due to the febrile phase, but it was not true of serum bilirubin and serum alkaline phosphatase indicating that the physiological basis for the rise and fall in the serum levels of these components must be different.

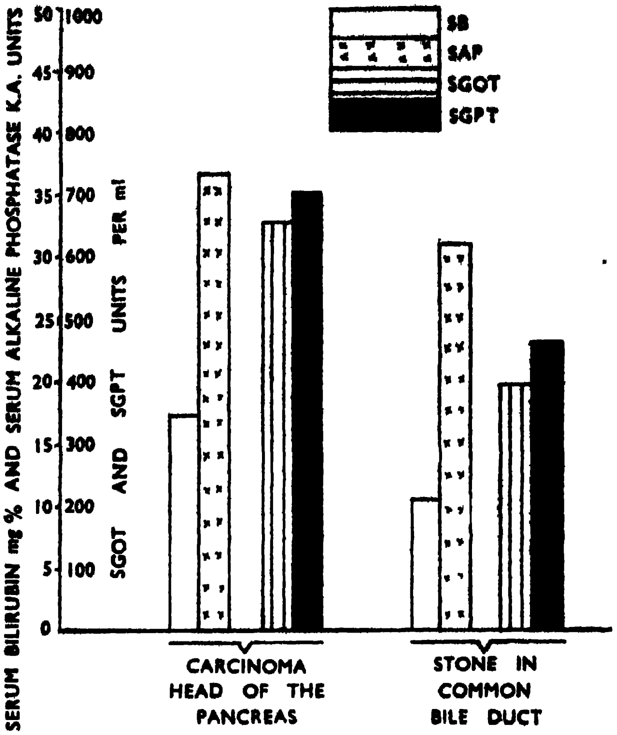


Fig. 3

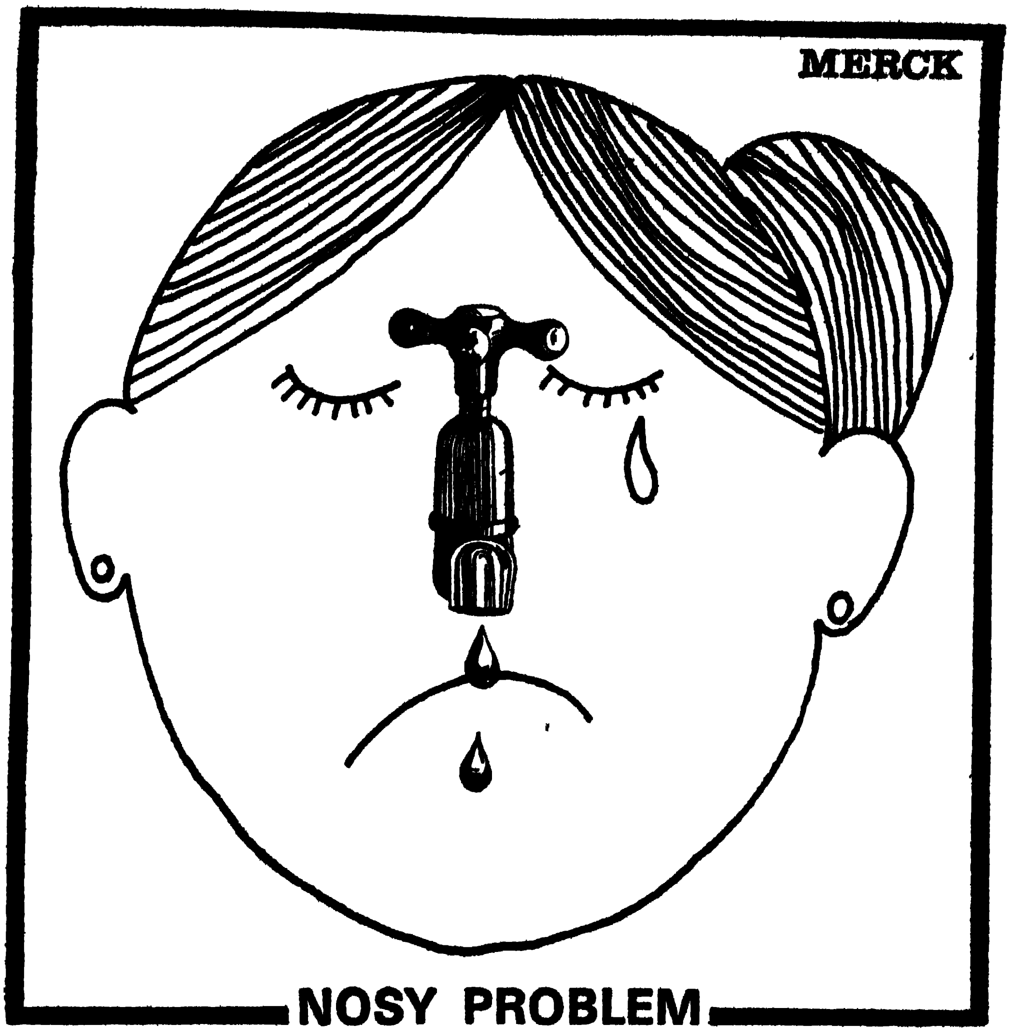
SUMMARY AND CONCLUSIONS

A detailed study of serum glutamic oxaloacetic and serum glutamic pyruvic transaminases has been carried out on 75 normal individuals and 25 patients of extrahepatic obstructive jaundice. In addition to these enzymes, serial estimations of serum bilirubin and alkaline phosphatase were also carried out on 25 patients with obstructive jaundice before and after the operative relief of the obstruction.

SGOT and SGPT levels in 75 individuals of both the sexes differing in age ranged from 17-99 units/ml. with a mean of 52.8 units/ml. and 22-95 units/ml. with a mean of 46.8 units/ml. respectively. Values exceeding 100 units/ml. have been taken as abnormal.

SGOT, SGPT, alkaline phosphatase and serum bilirubin levels were constantly high in all cases of obstructive jaundice. All the values were found to be higher in cases of carcinoma of the pancreas than those of the ordinary calculus obstruction cases.

Both SGOT and SGPT levels followed a similar pattern before and after the relief of



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obstruction. In the diagnosis and prognosis of obstructive jaundice, estimation of SGPT does not appear to be superior to that of SGOT.

The pre-operative levels of serum bilirubin, alkaline phosphatase and transaminases did not have any relation with each other.

The pattern of decline of average mean levels of SGOT, SGPT, alkaline phosphatase and serum bilirubin after operative relief of the obstruction has been similar. Those patients who had rise of temperature after the operation showed high levels of SGOT and SGPT.

The use of SGOT, SGPT, alkaline phosphatase and serum bilirubin as panel provide all the information and help in the assessment of the functions of the liver in obstructive jaundice.

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2

Comparative Study on Titres of Anti-A and Anti-B Iso-Agglutinins in Males and Females

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Since Schiff and Mendlowicz (1926) recorded difference of titres anti-A and anti-B iso-agglutinins in sera from different individuals, multiple investigations have been carried out to search for any factor responsible for this. Some of them are age (Thomsen and Kettel, 1929), heredity (Carlinfanti, 1948), allergic condition (Callender and Race 1946), immunological hyperreactivity (Greger *et al.*, 1951), climate and season (Shaw and Stone, 1957; Mayeda, 1966), environment (Tovey *et al.*, 1970), immunological tolerance (Jacobowicz *et al.*, 1959) and the blood groups of individuals (Thomsen and Kettel, *loc. cit.*; Ichikawa, 1959). Besides those, specific stimulus by injecting A and/or B antigens and by non-specific stimulus viz., pregnancy, even of non-heterospecific nature (Zuelzer and Kaplan, 1954; Lucia and Hunt, 1964) and chronic blood loss in form of repeated blood donation or any chronically haemorrhagic condition (Dutta and Roy, 1967) have been observed to cause enhancement of those titres. Nijenhuis and Bratlie (1962) while searching for any possible correlationship between these titres and monozygote or dizygote twins accidentally found higher score of anti-B iso-agglutinin in females when compared with the males but could not explain the phenomenon. In this communication, titres of anti-A and anti-B iso-agglutinins have estimated in normal males and females and an explanation

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for this difference observed has been suggested. Uptil now, no such study has been undertaken.

MATERIAL AND METHOD

206 male and 111 female subjects have been studied at random from the population. The ages of subjects have been kept restricted between 20 and 50 years to avoid gross variation of the titres of those iso-agglutinins at the extremes of age. To maintain equality of ethnic origin, dietary and nutritional status, only Bengalee subjects from middle class family living on mixed diets have been selected. Histories of previous illness and recent vaccination, inoculation or injection of any sera has been recorded to avoid accidental 'A' and 'B' antigenic immunisation. In female group, only those without a history of pregnancy have been included to avoid its sensitising effect on those antibodies. Both the male and female subjects had equal percentage of blood groups, which were parallel with those of the general population of the locality (Central Blood Bank, Calcutta, data). Observations were spaced throughout the year with proper planning to avoid any seasonal variation of those iso-antibodies. As repeated blood donation has been observed to enhance those titres, those individuals, who had donated blood before were rejected. Similarly, the female subjects who gave history of menorrhagia were excluded also.

Sera after inactivation of complement were titrated in saline by adopting a standard double titration technique. The test was carried out in 2″ × ¼″ tubes with 0.04 ml. (3 drops from a pasteur pipette) of the fluid as unit volume.

The range of dilution was carried out from undiluted to a dilution of 1/256. Equal volume of 4 per cent suspension of fresh pooled appropriate 'A' or 'B' red cells was used as antigen. To avoid irregularity of antigenic strength of red cells in tests performed at different times, cell suspensions were prepared by mixing equal volumes of red cells from three healthy individuals of the same blood group. The reaction was allowed to take place at a constant temperature of 25°C (room temperature) for two hours. The result was then read without centrifugation. The last tube showing '+' reaction (i.e. faint granular appearance just visible in the tube ; the microscopic appearance reveals clumps of more than 20 cells) was accepted as the end point. The reciprocal of that particular dilution was taken as 'titre'. The group 'O' sera were tested for anti-A and anti-B separately.

RESULTS

206 male subjects consisting of 72 group 'O', 86 group 'B', and 48 group 'A' individuals gave rise to 158 anti-A and 120 anti-B iso-agglutinins for test. The result is tabulated in Table 1.

Similarly, 111 female subjects composing 39 group 'O', 48 group 'B', and 24 group 'A' individuals gave rise to tests for 87 anti-A and 63 anti-B iso-agglutinins. The result is presented in Table 2.

Analysis of the result shows that both in males and females when titres of anti-A iso-agglutinins are compared with those of anti-B, they have almost equal percentage of population in each stage of titre or at most the

Table 1—*Showing Distribution of Male Population having Anti-A and Anti-B Iso-agglutinins at Different Stages of Titre*

	T	I	T	R	E	Total
	16	32	64	128	256	
Anti-A	49(31.01%)	57(36.08%)	35(22.15%)	15(9.49%)	2(1.27%)	= 158
Anti-B	30(25.00%)	50(41.67%)	24(20.00%)	14(11.67%)	2(1.66%)	= 120
Total	79(28.41%)	107(38.49%)	59(21.22%)	29(10.44%)	4(1.44%)	= 278

Table 2.—*Showing Distribution of Female Population having Anti-A and Anti-B Iso-agglutinins at Different Stages of Titre*

	T	I	T	R	E	Total
	16	32	64	128	256	
Anti-A	4(4.60%)	26(29.89%)	28(37.18%)	20(22.99%)	9(10.34%)	= 87
Anti-B	6(9.52%)	18(28.57%)	13(20.64%)	22(34.92%)	4(6.35%)	= 63
Total	10(6.67%)	44(29.33%)	41(27.33%)	42(28.00%)	13(8.67%)	= 150

difference between them at one stage is counterbalanced by the next. Statistically also, in normal males (Table 1) $\chi^2_3 = 1.96$, P value between .80 and .70 which is not significant. Similarly, in case of normal females (Table 2) $\chi^2_4 = 5.71$ with P value between .30 and .20 which is also not significant. This indicates that the titres of anti-A and anti-B were not systematically higher or lower than the other both in males and in females. The majority of group 'O' sera gave equal titres of anti-A and anti-B iso-agglutinins in both the groups of subjects. Moreover, the results show that the titres of anti-A and anti-B achieved by group 'O' are not systematically higher than those achieved either by group 'A' or group 'B'. The striking part of the study is the inequality of the distribution of male and female individuals at different stages of the iso-agglutinin titres. The results are presented in Table 3 and Fig. 1.

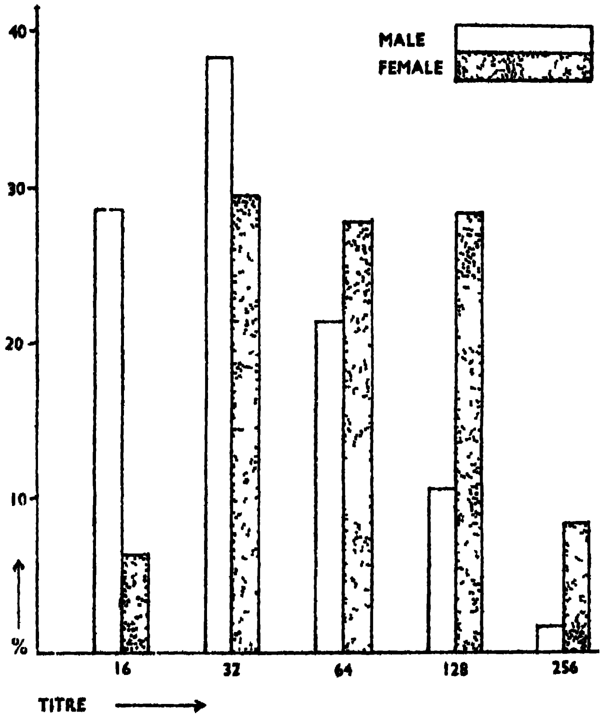

Fig 1

On analysis of the comparative tables it is evident that there is a higher percentage of males with low titres than females, while among the individuals with high titres there is a higher percentage of females than the males. Statistical evaluation (Table 3) shows $\chi^2_4 = 56.79$, with P value $< .01$, which is significant. This confirms the observed difference between the percentage distribution of titres of males and females.

DISCUSSION

The observed result supported by statistical evaluation indicates higher titres of anti-A and anti-B iso-agglutinins on the average in normal females when compared with normal males. As the distribution of individuals having anti-A iso-agglutinin runs parallel with those having anti-B both in males and females, it is evident that the enhancement observed is shared by both of the iso-agglutinins. The factors which have been held responsible so far, to govern the anti-A and anti-B titres, viz., age, blood groups etc., have been kept equal in both the group of subjects under study. So the enhancement observed appears to be a true and real one. This finding corroborates and confirms the finding of Nijenhuis and Bratlie (*loc. cit*). The factors which may be suspected responsible for this enhanced titres of these iso-agglutinins in females are, constitutional ability to produce enhanced iso-antibodies, hormonal factors, higher sensitivity to A and/or B antigenic stimulus and repeated blood loss through menstruation. Of these suspected causative factors, repeated blood loss through menstruation stands most probable because it has been observed that repeated blood donation causes enhancement of titres of anti-A and anti-B iso-agglutinins both in male and female blood donors compared with normal individuals (Dutta and Roy, *loc. cit.*). Females losing blood in every menstrual cycle can be compared with the status of a regular blood donor though the amount of lost blood in former case is less. This can be substantiated by observation of Moore (1948) who estimated that the average loss of blood through menstruation per year is 650 ml., but in some cases it is much more than this. As the enhancement of the titres has been observed to affect both the anti-A and anti-B iso-agglutinins equally and in

Table 3—*Showing Distribution of Males and Females at Different Stages of Iso-agglutinin Titres*

	T	I	T	R	E	Total
	16	32	64	128	256	
Male	79(28.41%)	107(38 49%)	59(21.22%)	29(10 44%)	4(1.44%)	= 278
Female	10(6.67%)	44(29.33%)	41(27.33%)	42(28 00%)	13(8 67%)	= 150

all the blood groups (viz., 'O', 'A' and 'B'). It is indicated that the titres of the iso-agglutinins have been increased as a result of general non-specific stimulus.

SUMMARY

On the average, females of groups 'O', 'B' and 'A' have been shown to have higher titres of anti-A and anti-B iso-agglutinins than males.

Repeated blood loss through menstruation has been suggested as the cause of the higher titres.

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Role of Diagnostic Aspiration of Peritoneal Fluid in Acute Abdominal Conditions

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Virulent organisms from various abdominal viscera are the chief causal factors which produce contamination of the peritoneal cavity and thus exert an important role in the incidence of mortality and morbidity. Diagnostic needle aspiration of the peritoneal cavity, its culture and drug sensitivity, is a newer concept in the management of acute abdominal lesions. It can greatly reduce the morbidity and mortality. Our observations of diagnostic aspiration have been discussed and evaluated in the present paper.

Though bacteriological examination of peritoneal fluid has been reported by quite a few workers, the use of peritoneal aspiration for diagnosis and treatment has been used by a few (Trusler *et al.*, 1935; Hill *et al.*, 1942; Veith, 1967).

MATERIAL AND METHOD

Eighty-six patients of acute abdominal conditions admitted to the wards of Lala Lajpat Rai Memorial and Associated Hospitals, Kanpur, were selected for bacteriological examination of peritoneal fluid for the present study. Peritoneal aspiration was done aseptically with a sterilised syringe and aspiration needle. The aspiration needle was passed in the flank taking care of avoiding injury to the bowel loops. The fluid obtained was subjected to bacteriological study.

OBSERVATIONS

Table 1 shows the incidence of groups of cases studied.

In 35 cases the culture was sterile after 48 hours of incubation at 37°C. Positive cultures

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Table 1—*Showing the Incidence of Group of Cases Studied*

Group of cases	No of cases
Acute inflammatory:	9
a. Acute appendicitis (4)	
b. Acute peritonitis (4)	
c. Acute cholecystitis (1)	
Acute perforations:	30
a. Gastroduodenal perforations (12)	
b. Appendicular perforation (3)	
c. Ileum perforations (15)	
i. Non-specific (10)	
ii. Typhoid (5)	
Acute obstructions:	38
a. Volvulus of small bowel (8)	
b. Volvulus of sigmoid (7)	
c. Intussusception (1)	
d. Adhesions (14)	
e. Stricture (7)	
f. External hernias (1)	
Colics (intestinal)	2
Mesenteric vein thrombosis	2
Blunt injury abdomen	1
Pelvic abscess	4
Total	86

were obtained in 50 cases. One of the specimens of peritoneal fluid was contaminated. *Esch. coli* alone grew in 23 cases (pure infection). In 16 cases it was cultured along with other organism (mixed infection). Single organisms other than *Esch. coli* were cultured in 7 cases. Combination of other organisms (other than *Esch. coli*) were cultured in 4 cases (Table 2).

Table 2—*Showing Type of Organisms Involved in 50 Positive Cultures*

Type of organisms		No. of cases
Escherichia coli		23
Escherichia coli with other organisms:		16
a. *Proteus vulgaris*	4	
b. Staphylococcus	9	
c. Streptococcus	3	
Other organisms alone:		7
a. *Klebsiella aerogenes*	3	
b. *Pseudomonas pyocyaneus*	1	
c. *Proteus vulgaris*	1	
d. Staphylococcus	2	
Other organisms in combination:		4
a. Staphylococcus and *Proteus vulgaris*	3	
b. Streptococcus and staphylococcus	1	

A. *Acute inflammatory group*—In the acute appendicitis group (4 cases) sterile culture was obtained in 75 per cent of cases and positive culture of mixed infection (*Esch. coli* and Staphylococcus) in 25 per cent of the cases. In the case of positive culture the appendix was gangrenous and peritoneal fluid was examined after 2 days of onset of symptoms.

Acute peritonitis formed 4.7 per cent (4 cases) of all the acute abdominal conditions in the present series. Pure culture of *Esch. coli* was found in 25 per cent cases. *Esch. coli* with *Strept. faecalis* occurred in 50 per cent and *Esch. coli* with Staphylococcus in 25 per cent of cases.

In one case of acute cholecystitis, serous peritoneal fluid was sterile on culture.

B. *Acute perforation group*—Gastroduodenal perforation comprised about 40 per cent of all the cases of perforation. In the present series *Esch. coli* alone was found in 41.6 per cent and *Pr. vulgaris* alone in 8.3 per cent as a pure culture. *Esch. coli* with *Staph. aureus* and *Pr. vulgaris* was found in 33.3 per cent of cases. In the present series *Esch. coli* was the commonest organism both in pure as well as in mixed infection.

Appendix perforations claimed 10 per cent of all the acute perforations. *Esch. coli* was cultured in two thirds of the cases (66.6 per cent) *Ps. pyocyaneus* was cultured in one third of the cases (33.3 per cent).

Positive cultures were obtained in all the cases of terminal ileum perforation. *Esch. coli* was cultured in all the cases except one. There were 5 cases of terminal ileum perforation complicating enteric fever in the present series. *Esch. coli* was found in 60 per cent cases. *Kl. aerogenes* was cultured in 20 per cent cases. In Vyas' (1964) series of 15 cases of intestinal perforations in typhoid fever, *Esch. coli* alone was cultured in 26.6 per cent cases.

C. *Acute obstructions*—In 71.1 per cent cases of acute obstruction, the peritoneal fluid was sterile. In 28.9 per cent of cases it was positive. In those case in whom the culture was positive, either the loop was gangrenous or peritoneal fluid sample was obtained too late. *Esch. coli* was cultured in 91 per cent either as pure culture or as a mixed infection in positive culture cases. Staphylococcus and Streptococcus were the other organisms cultured in the present series.

In volvulus of small bowel with 5-6 days' duration, sterile cultures were obtained in 50 per cent and positive cultures in the remaining 50 per cent of the cases. *Esch. coli* was obtained as pure culture in most of the cases. In volvulus of the sigmoid colon (7 cases) sterile cultures were found in 57 per cent and positive cultures in 43 per cent cases after 48 hours.

In intussusception of 3 days' duration mixed infection of *Esch. coli* with Staphylococcus was recorded.

In acute obstruction (1-4 days' duration) caused by adhesions and bands, peritoneal fluid was sterile in 92.9 per cent of cases. In remaining 7.1 per cent cases, positive culture of Staphylococcus and *Strept. viridans* were noted.

In strictures of bowel cases of 12-15 days' duration, positive cultures were shown in 14.5 per cent and sterile culture after 48 hours in 85.5 per cent cases. Kolmer (1969) described that peritoneal fluid is free from organism in tuberculous strictures.

In external hernia (1 case) *Pr. vulgaris* and *Esch. coli* were cultured due to congestion and oedema of the loop.

D. *Intestinal colic*—In two cases of intestinal colic of a few hours duration, the aspirated peritoneal fluid was sterile after 48 hours.

E. *Mesenteric vein thrombosis*—Two cases of intestinal infarction were included in the series. One of these had a mesenteric twist leading to infarction of part of the loop with the duration of symptoms of 3 days. The peritoneal fluid obtained by aspiration before operation showed moderate growth of *Esch. coli*. The other case which had symptoms for 4 days, showed profuse growth of *Esch. coli* with Staphylococcus.

F. *Blunt injury abdomen*—One patient was admitted after a blunt injury to the abdomen in a semiconscious state. Peritoneal fluid was aspirated and culture revealed a scanty growth of *Kl. aerogenes*.

G. *Pelvic abscess*—In all the 4 cases of pelvic abscess, *Esch. coli* was demonstrated. It was cultured as a pure infection in 50 per cent cases and as mixed infection (Staphylococcus and *Pr. vulgaris*) in 50 per cent cases. The duration of symptoms was 5 days to 2 months. In one series of 336 cases, Shepherd (1960) reported 202 cases where colon bacilli were cultured.

DISCUSSION

The culture of the peritoneal aspirate in acute inflammatory group revealed that the culture was sterile in acute appendicitis if there was no gangrene or peritonitis. *Esch. coli* and Staphylococcus were cultured in the lone case of gangrenous appendicitis. This patient later died after the operation. Peritoneal fluid may be sterile in most cases of acute inflammatory conditions but Aird (1957) found the presence of mixed infection. Burnett (1956) observed the presence of mixed infection (*Esch. coli* and Staphylococcus) in gangrenous appendicitis.

In the peritonitis group there was dominance of *Esch. coli* in the culture. *Strept. faecalis* and Staphylococcus were also cultured in a few of these cases. All the cases in this series were associated with high morbility and mortality. Bailey and Love (1965) also found that *Esch. coli* was a common invader and it was cultured as pure as well as mixed infection in their series. Root *et al*. (1965) supported the view of predominance of *Esch. coli*. In acute inflammations with no sign of peritonitis, like acute cholecystitis the culture was sterile. There was least morbidity and mortality in this group.

In the gastroduodenal perforation series, there was highest incidence of morbidity and mortality. *Esch. coli*, either alone or with *Staphylococcus aureus* and/or *Pr. vlugaris* were isolated in, nearly all of these. Aird (*loc. cit.*) also observed the presence of *Esch. coli* in 100 per cent of his cases, either alone or in association with other organisms. He also observed that in 20 per cent cases, Streptococcus and Staphylococcus can be cultured in spite of acidic gastric juice. Bailey (1967) also found positive cultures (Streptococcus and Staphylococcus) after 12 hours. He recorded that peritoneal fluid may be found sterile, due to bacteriostatic effect of hydrochloric acid. Shepherd (*loc. cit.*) reported the pressence of Streptococcus, Staphylococcus and coliform group of organisms in his series.

In appendicular perforations *Esch. coli* and/or *Ps. pyocyaneus* were cultured. Maingot (1957) observed that in these cases infection was usually mixed though pure culture may also be obtained. *Esch. coli* was the predominant organism in his series. Kaufman (1948) also observed the dominance of *Esch. coli* and isolated certain particular serological type of *Esch. coli* in his series. Kolmer (*loc. cit.*) supported the view that mixed infection predominates in appendicular perforation.

In the ileal perforations moderate or profuse growth of *Esch. coli* was noted in all the cases. In cases associated with high mortality, *Esch. coli* was found along with *Strept. faecalis* and *Staph. aureus*. Finland (1960) found Gram-negative bacteria in the perforations of gastro-intestinal tract especially of the lower one. Kolmer (*loc. cit*), Barnside and Cohn (1961) and Barnett (*loc. cit.*) have also observed the presence of *Esch. coli* in ileal perforations.

In cases of volvulus of small bowel, intussusception, obstructions due to adhesion and strictures, etc., with short duration the culture was sterile. But after 2-3 days duration *Esch. coli*, Staphylococcus, *Strept. viridans*, etc., were cultured. The incidence of positive culture was higher in those cases who had higher morbidity and mortality. In colics the peritoneal aspirate tended to be sterile. In cases of mesenteric vein thrombosis profuse growth of *Esch. coli* with or without Staphylococcus was found. Both the cases of this series died later on. Hill *et al.* (*loc. cit.*) obtained positive cultures of profuse Gram-negative bacilli, after 4 hours of establishment of infarction. Gray and Kidd (1963) have also made similar observations. Headington *et al.* (1967) however found sterile cultures in his series of mesenteric infarction.

Pelvic abscess revealed the presence of *Esch. coli,* Staphylococcus and *Pr. vulgaris*.

The overall picture showed that in the present series, sterile cultures were obtained in 41.8 per cent cases and positive cultures in 58.2 per cent cases. This high percentage of sterile cultures after 48 hours is explained on the basis that most of the sterile cultures were found in acute obstruction, most of them were mechanical. The obstructive segment was found viable in most of the cases. In these cases, bacterial migration or escape from the lumen to the peritoneal cavity did not occur. In positive cultures, *Esch. coli* was the main organism which was cultured in most of the cases (46 per cent) as shown in Table 2. It was because gastro-intestinal perforations comprise a group of cases where organisms escape into the peritoneal cavity. As suggested by Bailey (*loc. cit.*) *Esch. coli* is the commonest invader of peritoneal cavity. *Pr. vulgaris,* Staphylococcus, Streptococcus, *Ps. pyocyaneous* and *Kl. aerogenes* were the organisms responsible for pure as well as mixed infection (54 per cent). Mixed infection was found in 70.7 per cent. This was supported by Kolmer (*loc. cit.*) who observed *Esch. coli,* Staphylococcus and Streptococcus to be the common organisms in mixed infection.

The identification of the bacteria was of great help in the diagnosis and in assessing the severity of the disease.

Mortality in the present series was 20.93 per cent. High incidence of mortality was observed in cases in which moderate and profuse growth of *Esch. coli* was found. The mortality was higher in cases who showed profuse growth of these organisms. *Pr. vulgaris* and Klebsiella either in pure or mixed infection were obtained but did not survive. No complication was encountered in any case after aspiration.

SUMMARY

Peritoneal fluid aspiration is a safe and reliable adjuvant in the diagnosis and prognosis of acute abdominal conditions.

Peritoneal fluid aspiration and culture was done in 85 cases with acute abdominal conditions. It was positive in 50 cases and sterile in 35 cases after 48 hours of incubation. *Esch. coli* was the most common organism detected in most of the cases. Klebsiella, Pseudomonas, *Pr. vulgaris,* Staphylococcus, Streptococcus were also found by culture in the present series. The organism detected in each acute abdominal condition have been described and discussed.

The presence of profuse growth of *Esch. coli, Pr. vulgaris* and Klebsiella in the peritoneal aspirate indicated higher morbidity and mortality. No complication was encountered in the present series.

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Reserpine-Frusemide and Reserpine-Polythiazide Combinations in Hypertension

A. B. MUKERJEE*

Hypertension (both essential and secondary) reduces the expectation of life and raises many social and economic problems. The role of hypotensive drugs to reduce incidence and severity of cardiovascular, cerebrovascular and renal complications has been established and, a series of hypotensive drugs have been discovered one after another and given a fair trial. *Rauwolfia serpentina*, the oldest member of the hypotensive family, has been tried long. Recently, however, diuretics have been generally accepted as basic therapy in the management of hypertension. Hypotensive effect of the latter is not much and in severe cases quite inadequate. Hence they are usually used with other antihypertensive agents preferably Rauwolfia alkaloids (Bohlau and Hellwich, 1956).

Since 1958, chlorothiazide and its various derivatives have been used for the treatment of selected patients with hypertension. These are saluretics which play an important part in the reduction of blood pressure in hypertensive subjects as they greatly potentiate the action of other hypotensive drugs, reduce unpleasant side effects and usually allow a smoother control of blood pressure without sudden fluctuations. Polythiazide has been used with some success. It has few side effects, but the use of polythiazide alone is not sufficient for the treatment of hypertension of severe degree. It has been found that when this drug is used in combination with reserpine, an effective fall of blood pressure is achieved. Recently, a non-thiazide anthralinic acid derivative, frusemide, has been shown to have a satisfactory natriuretic effect. It also likewise lowers the blood pressure when administered alone and in combination with other antihypertensive agents (Woelfer *et al.*, 1964; Moeller *et at.*, 1965).

In the light of these considerations two drug-combinations have been selected and given a trial in a comparative study: reserpine with frusemide (Group A) and reserpine with polythiazide (Group B). The present paper reports the results of such a study with these two drug-combinations in hypertension expressed in terms of Group A and Group B respectively.

MATERIAL AND METHOD

The present study was carried out at the Ramkrishna Mission Seva Pratisthan, Calcutta. There were sixty patients of hypertension (3 indoor and 27 outdoor in Group A, 4 indoor and 26 outdoor in Group B) selected for the present trial. Patients with heart failure and manifest oedema were excluded from the series.

Table 1—*Showing the Age and Sex Incidence of the Patients Studied*

Age in years	Male	Female
41 - 50	12	5
51 - 60	22	11
61 - 70	8	2
Total	42	18

The ages ranged from forty-one years to seventy years. They comprised 56 cases of essential hypertension and 4 cases of essential hypertension with diabetes mellitus.

Table 2—*Showing the Classification of Patients in two Groups According to the Severity of Hypertension*

Degree of Hyper-tension	Range of blood pressure		Number of Cases		Total Cases
	Systolic (mm Hg)	Diastolic (mm Hg)	Group A	Group B	
Mild	160-180	90-110	10	10	20
Moderately severe	181-200	111-130	20	20	40

All the patients were thoroughly examined physically during the first visit. The blood pressure was determined daily in hospitalised patients, while the same was usually measured at weekly intervals in the Outdoor Department in the recumbent position and when necessary, in the standing position.

The statistical analysis of blood pressure records (both indoor and outdoor cases) was made between the fifth day and the seventh day, the fifteenth and the twenty-first day and, also at the end of treatment (in moderately severe hypertension cases), to study the statistically significant hypotensive effect of both the drug combinations.

Before the trial with each of the drugs, blood was drawn from each patient to measure its sodium, potassium and uric acid content, before and at the end of the observation period.

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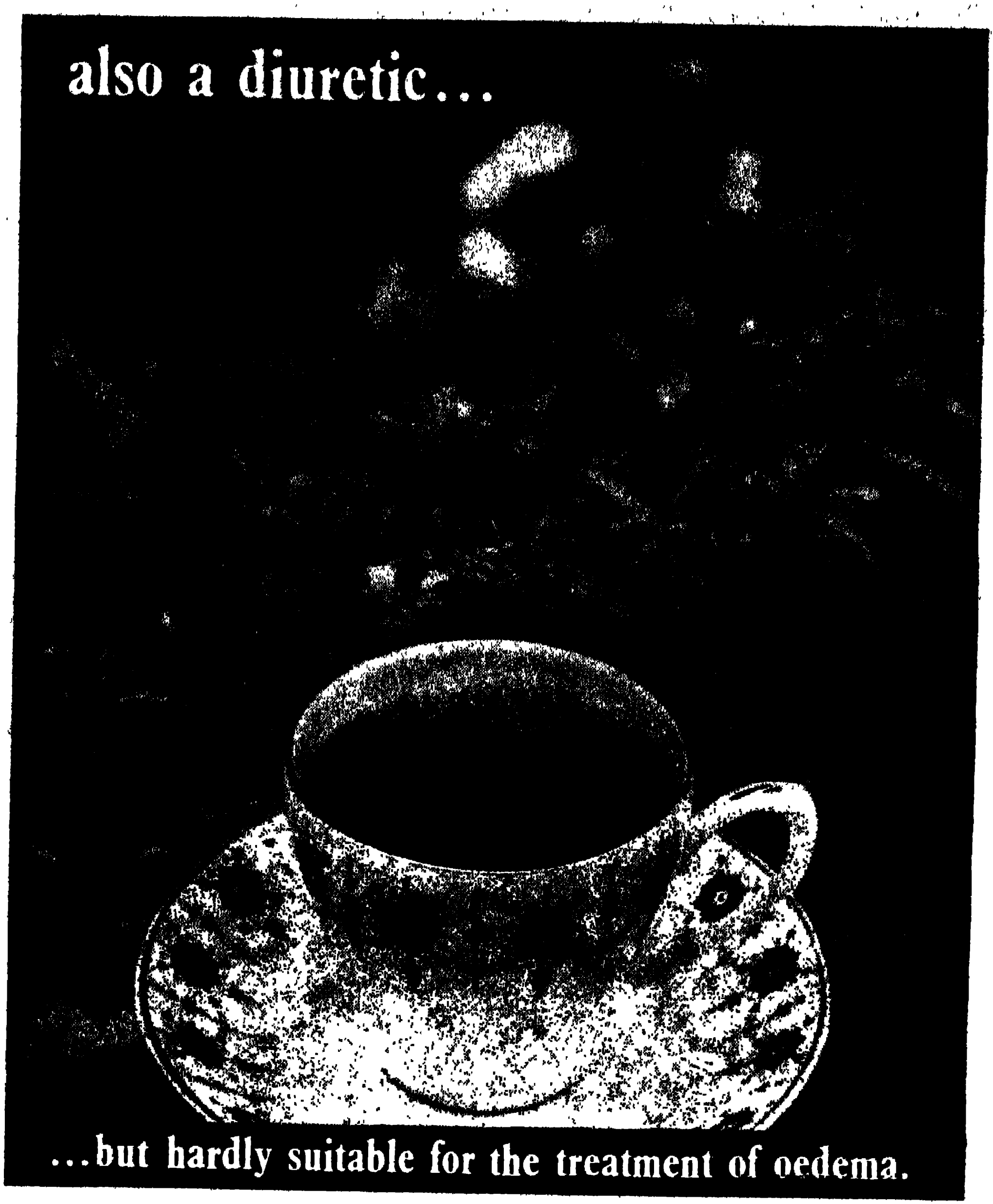

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Urea and fasting blood-sugar were however, determined in only 20 cases each of both the groups of moderately severe hypertension

In Group A the dose schedule varied from one tablet (0.1 mg. reserpine and 15 mg. frusemide) twice daily in mild hypertension to three times a day in moderately severe hypertension cases, while in Group B the dosage was one tablet (0.25 mg. reserpine and 1 mg polythiazide) once or twice daily in mild hypertension and twice or thrice daily in the moderately severe variety. The maintenance dosage was one to two tablets daily in Group A, while in Group B the maintenance dosage was one to one and a half tablet daily.

The total duration of treatment in the whole series varied from four to twelve weeks. During treatment, the patients were not allowed to take raw salt and food rich in salt Diabetic subjects were put on the usual dietary restric tions and anti-diabetic drugs as required were also used

RESULTS

10 cases of mild hypertension and 20 cases of moderately severe hypertension were treated with reserpine-frusemide (Group A) and the same number of each type of patients were treated with reserpine-polythiazide (Group B). The range of groupwise variation in blood pressure is shown in Table 3.

Table 3—*Showing Groupwise Variation in Range of Blood Pressure*

Group	Systolic (mm Hg) From	Systolic (mm Hg) To	Diastolic (mm Hg) From	Diastolic (mm Hg) To
Group A				
Mild hypertension	180	165	110	105
Moderately severe hypertension	200	180	130	115
Group B				
Mild hypertension	180	160	110	100
Moderately severe hypertension	200	180	130	115

The summary of results is given in Tables 4 and 5.

Table 4—*Showing the Reduction of Blood Pressure (Mean ± Standard Deviation, 'P' Value) in mm Hg During Treatment with Reserpine-Frusemide (Group A)*

Degree of Hypertension	No of Cases	Mean initial blood pressure		Mean reduction in blood pressure				'P' value
				1st week		2nd - 3rd week		
		Systolic	Diastolic	Systolic	Diastolic	Systolic	Diastolic	
Mild	10	172 5	108 5	7 5 ± 2 5	6 5 ± 2 29	17 5 ± 2 5	16 0 ± 3 0	∠0 01
Moderately severe	20	190 5	121 5	8 75 ± 2 68	5 75 ± 1 47	22 75 ± 4 32	20 50 ± 3 72	∠0 01

Table 5—*Showing the Reduction of Blood Pressure (Mean ± Standard Deviation, 'P' Value) in mm. Hg During Treatment with Reserprine-Polythiazide (Group B)*

Degree of Hypertension	No of Cases	Mean initial blood pressure		Mean reduction in blood pressure				'P' value
				1st Week		2nd - 3rd Week		
		Systolic	Diastolic	Systolic	Diastolic	Systolic	Diastolic	
Mild	10	170.5	107 5	7 0 ± 2 44	6.5 ± 2 29	18 0 ± 3 31	15.5 ± 3 5	∠0.01
Moderately severe	20	191.5	122.5	9 75 ± 3 53	6.5 ± 2.29	23 25 ± 4 26	21.75 ± 3 26	∠0 01

At the end of therapy however, it was observed that the normotensive level was reached with both the two drug combinations in the mild variety of hypertension. In the moderately severe variety, the mean reduction of blood pressure is shown in Table 6.

Though apparently the above results show some slight difference in the mean reduction of blood pressure, on use of the two different drug combinations, the treatment with reserpine-frusemide gave slightly better results (difference in fall being 0.50 mm. Hg—systolic blood pressure) during the first week of treatment in mild hypertension The statistically significant figure was the same in both the series ('P' value <0 01) In the treatment of each case, it was observed after the period (2-3 weeks) and also at the end of the trial in both mild and moderately severe hypertension, that the blood pressure was effectively controlled on use of both the drugs A slightly better reduction in blood pressure (both systolic and diastolic), was however noticed with reserpine polythiazide But the results on the whole, were statistically significant with both the agents ('P' value <0 01)

Side effects—As to the side effects, one case only had general weakness and nausea, while nasal congestion was complained of by another patient when treated with reserpine-frusemide

One patient on reserpine-polythiazide, complained of paresthesia during the earlier part of treatment. Two other patients suffered from general weakness and giddiness when treated with the same drug.

Biochemical changes—There was scarcely any significant biochemical change in the use of both the drugs. There was some decrease in the potassium level (slightly more in Group B), but it was not enough to produce symptoms suggestive of hypokalaemia A small rise in the blood sugar level (1.2 mg. per cent) was observed in some cases in the same group Though there was a tendency towards a small rise in the uric acid level with the same drug, it was of no clinical significance There was no significant change in the urea level in both the series (Tables 7 and 8).

DISCUSSION

The hypotensive effect of oral diuretics (thiazides and non-thiazide anthralinic acid derivatives) in combination with reserpine have proved to be successful in mild to moderately severe hypertension These oral diuretics alone, however control hypertension only of the mild variety

Woelfer *et al* (*loc cit*) while studying the hypotensive action of frusemide, found in their series, a mean reduction in blood pressure of 5 7 per cent systolic and 6 per cent diastolic,

Table 6—*Showing the Mean Reduction of Blood Pressure at the End of Therapy in Moderately Severe Hypertension of Both Groups*

Group	Mean B P in mm Hg before therapy		Mean B P in mm Hg at the end of therapy		Mean reduction in B P. in mm Hg	
	Systolic	Diastolic	Systolic	Diastolic	Systolic	Diastolic
Group A	190 50	121 50	151 0	90 75	39.5 ± 4 71	30 75 ± 4 54
Group B	191 75	122 50	151 75	91 00	40 00 ± 5 00	31 5 ± 3 90

Table 7—*Showing Serum Sodium, Potassium, Uric Acid, Blood Sugar (Fasting) and Urea Levels, Before and After Treatment with Reserpine-Frusemide (Group A)*
(Mean Values ± Standard Deviation)

	No of cases	Before therapy	After therapy	Difference
Sodium (mEq /litre)	30	141 4 ± 0 76	140 8 ± 0 82	– 0.6
Potassium (mEq./litre)	30	4 5 ± 0.53	4 3 ± 0 63	– 0.2
Uric Acid (mg./100 ml)	30	4 2 ± 0.26	4.1 ± 1.1	– 0.1
Sugar (mg./100 ml.)	16	98 4 ± 7.6	98.7 ± 7.7	+ 0.3
Urea (mg /100 ml.)	20	31 4 ± 12 69	31.9 ± 12 12	+ 0.5

Table 8—*Showing Serum Sodium, Potassium, Uric Acid, Blood Sugar (Fasting) and Urea Levels, Before and After Treatment with Reserpine-Polythiazide (Group B)*
(Mean Values ± Standard Deviation)

	No. of cases	After therapy	Before therapy	Difference
Sodium (mEq./litre)	30	141 2 ± 0.52	140 4 ± 1.02	− 0.8
Potassium (mEq./litre)	30	4 4 ± 0.09	4 1 ± 0.05	− 0.3
Uric Acid (mg./100 ml.)	30	4 1 ± 0 22	4 2 ± 0 17	+ 0.1
Sugar (mg./100 ml.)	20	97 8 ± 6.2	99 0 ± 7.3	+ 1.2
Urea (mg./100 ml.)	20	32 0 ± 2.60	32 7 ± 2.97	− 0.7

while Banerjea and Mukherjee (1968) observed that with thiazides, the fall in blood pressure was by 4.5 per cent. A further step in the management of hypertension opened out, when derivatives of thiazides (polythiazide) were added to reserpine. This combination definitely helped in the further reduction of blood pressure.

Reserpine-frusemide combination—Engelmann (1962) found that in 92 cases out of 100 (with various types of hypertension), the treatment with reserpine-frusemide combination was successful in a daily dose of 20-60 mg. frusemide and 0.2-0.6 mg. reserpine. At the beginning of the treatment, the mean blood pressure of the whole series was 193/113 mm. Hg After the eighth day, it was 168/98 mm. Hg (reduction amounted to 25/15 mm. Hg) and, after the fifteenth day it was 165/96 mm. Hg (reduction from the previous record was 3/2 mm. Hg, while from the initial record it was 28/17 mm. Hg). Thus, it was observed that the mean blood pressure was reduced by 14.4 per cent systolic and 15.04 per cent diastolic, as compared with the levels at the time of the first examination.

Bohlau and Hellwich (*loc. cit.*) tried 21 cases of mild hypertension and 42 cases of moderately severe hypertension with reserpine-frusemide combination and found that within 2-3 weeks, the average systolic blood pressure had come down from 176 to 159 mm. Hg (9.6 per cent) and the diastolic blood pressure from 102 to 92 mm. Hg (9.8 per cent) in mild hypertension, while the decrease was found to be from 189 mm. Hg to 156 mm. Hg systolic blood pressure and from 109 mm, Hg to 93 mm. Hg diastolic blood pressure in moderately severe hypertension. This works out to 17.4 per cent reduction in systolic blood pressure and 15 per cent reduction in diastolic blood pressure.

Atkins (1966) in 10 cases of hypertension tried reserpine-frusemide combination and found a fall in blood pressure: average systolic from 211-144 mm. Hg and diastolic from 118-78 mm. Hg i.e., in terms of percentage—31.7 per cent systolic and 33.9 per cent diastolic.

Klenke (1967) treated 70 patients suffering from hypertension with 1-3 tablets of same combination and observed a substantial fall in blood pressure in 58 cases after 3-6 weeks. The average reduction (systolic/diastolic) ranged from 31.3/13.5 to 37.3/18.8 mm. Hg; after 3-6 months it was from 39.8/18.1 to 47.0/20.4 mm. Hg. He also observed no rapid fall in blood pressure with collapse or cerebrovascular accident in the series.

In the present series of 10 cases of mild hypertension treated with same combination the average reduction of blood pressure was: systolic 17.5 mm. Hg ± SD 2.5 and diastolic 16.0 mm. Hg ± SD 3 0, while in the 20 moderately severe cases, the mean reduction was: systolic 22.75 mm. Hg ± SD 4.32 and diastolic 20.50 mm. Hg ± SD 3.72 within 2-3 weeks of therapy. At the end of the therapy, it was observed however, that the normotensive level was reached with this drug in mild hypertension, while in moderately severe hypertension there was a mean reduction of blood pressure systolic/diastolic by 39 5 mm. Hg ± SD 4.71/30.75 mm. Hg ± SD 4.54. This result with slight variations, is in line with that achieved by the other workers signifying the definite hypotensive effect of this drug combination.

Reserpine-polythiazide combination—Nanda *et al.* (1965) carried out a clinical study to evaluate the therapeutic effect of the combination of reserpine-polythiazide in the treatment of hypertension. Their series included 6 cases of mild hypertension and 8 cases of moderate hypertension. They found excellent response in mild hypertension and satisfactory control of blood pressure in moderately severe hypertensive subjects. The average reduction of blood pressure levels in their series was 26/18 mm. Hg in the recumbent position.

Rapardo and Casado (1963) reported similar results with the same combination in 19 out of 20 cases of hypertension. The average reduction of blood pressure was 51/52 mm. Hg.

In the present series of treatment with reserpine-polythiazide the mean reduction of blood pressure in 10 cases in mild hypertension was: 18.0 mm. Hg ± SD 3.31 systolic and 15.5 mm. Hg ± SD 3.5 diastolic, while in 20 cases of moderately severe hypertension the mean fall of systolic blood pressure was 23.25 mm. Hg ± SD 4.26 and the diastolic fall was 21.75 mm. Hg ± 3.26 within 2-3 weeks of therapy. At the end of the treatment, the mean reduction in blood pressure systolic/diastolic was 40.00 mm. Hg ± SD 5.00/31.5 mm. Hg ± SD 3.90. The difference in the reduction of blood pressure from systolic to diastolic was 8 mm. and 1 mm. of Hg, as reported by Nanda *et al.* (*loc. cit.*) and Rapardo and Casado (*loc. cit.*) respectively. In this present series, this difference was found to be 9.5 mm. Hg. Thus, this result has got close resemblance to that of the series of Nanda *et al.* (*loc. cit.*) and has a definite difference when compared to Rapardo and Casado (*loc. cit.*) series.

When the results obtained with the two drug combinations (Group A and Group B) are compared, it is apparent that there is some slight difference in the mean reduction of blood pressure between these two groups—the treatment with reserpine-frusemide giving a slightly better result (difference in the fall being 0.5 mm. Hg) during the first week of treatment in mild hypertension, but after 2-3 weeks and also at the end of the observation period, a slightly better reduction in blood pressure (both systolic and diastolic—0.5 to 1 mm. Hg/0.25 to 0.5 mm. Hg) was obtained with reserpine-polythiazide. The increased reserpine content of the later explains the slightly better result obtained clinically in the present series. But the statistically significant figure is the same in both the series, i.e., 'P' ∠0.01. Thus, the hypotensive action of both the drugs in identical series has proved to be equally successful.

Biochemical changes—Previous workers who had tried reserpine-frusemide combination in their series, found no significant hypokalaemia and no deterioration of carbohydrate tolerance (hyperglycaemia) in the same. Engelmann (*loc. cit.*) in his series, found no rise in the blood urea level but a rising serum uric acid tendency was observed. In our series, there were not many significant blood-biochemical changes, before and after therapy (Table 8).

Nanda *et al.* (*loc. cit.*) in their series, found no changes in the levels of serum sodium, but there was some decrease in the levels of serum potassium, which was however, not clinically significant. There was no change in the level of blood urea nitrogen. Rapardo and Casado (*loc. cit.*) likewise observed some decrease in serum potassium, while a rise in blood urea was not a feature in the same series. In the present series, the same observation holds true more or less.

By comparing the blood biochemical changes in both groups it was found that there was little deviation from the initial estimate of sodium, potassium, uric acid, urea and sugar levels, to that reached after treatment with either of the drugs (Tables 7 and 8).

Shah and Desai (1968) showed reversible diabetogenic effect with reserpine-polythiazide in 34.4 per cent of the patients receiving the drug. They noticed the return of the normal level of blood sugar within fifteen days after the withdrawal of the same. In our series also, a tendency towards rise in blood sugar level was noticed (1.2 mg per cent). Thus a remote possibility of the diabetogenic effect of their combination might arise particularly in prolonged therapy in cases of hypertension with latent diabetes.

The side effects of reserpine-frusemide in the present series were minimum as has been pointed out by various workers. With reserpine-polythiazide also, the problem was not very prominent. Giddiness due to postural hypotension was not a feature in the present series, as was observed by Nanda *et al.* (*loc. cit.*). Rapardo and Casado (*loc. cit.*) did not report any significant postural hypotension with reserpine-polythiazide. While comparing the side effects of both these drugs, a slight difference was however noticed in relation to the incidence of toxicity.

SUMMARY AND CONCLUSION

A total of 60 cases of hypertension were treated with reserpine-frusemide (Group A) and reserpine-polythiazide (Group B) combinations (30 in each group). Of these, 10 had mild hypertension and 20 had moderately severe hypertension in both the series.

In both the groups, a significant fall in blood pressure was observed ('P' value ∠0.01). There was no tendency to precipitous fall in blood pressure in Group A, while the same tendency was observed in Group B. The maximum fall in blood pressure used to start within 2-3 weeks of therapy with both the drug combinations.

The incidence of side effects was small and no significant change in blood biochemistry occurred in the study with both the drugs, excepting a little tendency of rise in the blood sugar level, with Group B drug combination.

Reserpine-frusemide and reserpine-polythiazide combinations are useful in the control of both mild and moderately severe varieties of hypertension.

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CASE NOTES

Appendiceal Calculi

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Faecal concretions in the lumen of the appendix are common but true appendiceal calculi are comparatively rare. The condition is of clinical importance because of the frequency with which such calculi give rise to difficulty in diagnosis. A case report of an appendiceal calculus resembling ureteric stones is presented.

CASE REPORT

Mr. R. N. M., male, 39 years, was admitted on 3-12-69 to Sassoon General Hospital, Poona, with complaints of attacks of colicky pain in the right renal angle which radiated to the right inguinal region, associated with distention of the abdomen and loose motions, for two years. He had no symptoms of dysuria or frequency of micturition.

He was a fit looking young man whose physical examination elicited tenderness in the right renal angle and right lumbar region.

Investigations—Urine examination was negative. Plain x-ray of the abdomen revealed an oval and homogeneously radio-opaque shadow of 1.5 × 0.5 cm. size, situated over the right transverse process of the fourth lumbar vertebra.

In intravenous pyelography the radio-opaque shadow was in line with the ureter below it. The ureter above it was not visualised and the right kidney did not show changes of obstructive uropathy. Barium meal study showed a 3 cm. long, well-filled appendix with absence of appendiceal tenderness. A possible diagnosis of right ureteric calculus was made.

Surgery—A right lateral (kidney incision) muscle cutting incision was made and the ureter up to the pelvic brim was found to be normal. On opening the peritoneum, a long, chronically inflamed, retrocaecal appendix was seen and a stone was felt in its tip. Appendicectomy confirmed its presence in the lumen.

DISCUSSION

Santorini (cited by Forbes and Lloyd-Davis, 1966) noted faecal concretions in the appendix in 1742. Wegeler (1813 cited by Forbcs and Lloyd-Davis, *loc. cit.*) found an appendiceal calculus, while Weisflog (cited by Forbes and Lloyd-Davis, *loc. cit.*) was the first to diagnose this condition radiologically. Various authors have given figures ranging from 0.1 to 3.0 per cent for the incidence of calculi in appendicectomy specimens (Candy, 1959). Collins (1955), in a study of pathology of 50,000 appendices, found calcified faecoliths in 302 while Forbes and Lloyd-Davis (*loc. cit.*) noted calculi in 29 appendices out of 1800 appendicectomy specimens.

Hard. faecal masses in the appendix are variously known as faecolith, coprolith, stercolith, enterolith, appendicolith or concretions. The formation of a calculus in the appendix is presumed to begin when a mass of inspissated faeces lodged in the lumen excites a low grade inflammation while being

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in mucus. The calcium and the phosphatic components of the mucus are precipitated out in layers upon the surface of this mass, occasionally resulting in size several times that of original appendiceal lumen (Fuller and Berndhard, 1968). Rarely, a gallstone may form the nucleus for an appendiceal calculus.

The stone may be single or multiple and may be of any size varying from 0.3 to 6 cm. Shahan (1940 cited by Shaw, 1965) described a case in which the organ contained twenty-three stones A stone weighing 8 g. and measuring 4×2×1 cm was described by Packard in 1921 (cited by Forbes and Lloyd-Davis, *loc. cit*) and is the largest calculus recorded

In 60 cases reviewed by Falson and Bernhard (1947), most of their patients were between the ages of 10 and 30 years and there was male preponderance of nearly 4 1, while Berg and Berg (1957) noted 25 per cent of their cases to be under five years of age

The calculi may present with acute inflammatory episode, perforation or gangrene of the appendix In a review of 110 cases Falson and Bernhard (*loc cit*) found 90 per cent of cases with signs of acute appendicitis and in almost 50 per cent of these, perforation had occurred, while Brady and Carroll (1957) noted perforation and gangrene in 32 out of 34 cases Perforation is three times more common than in the noncalculus group The remainder of cases of Falson and Bernhard (*loc. cit*) series had ill defined abdominal symptoms suggestive of peptic ulcer or ureteric colic The present case presented itself with right ureteric colic and so was Kanchan's case (1965). Intestinal fistula caused by the erosion of appendiceal calculi have been noted by Kjellman (1957)

Radiologically, the calculus will cast a shadow in the region of the right iliac fossa, but the position will vary with the position of the appendix Mobility may or may not be present In Kanchan's case (*loc cit.*) the stones were mobile while no mobility was seen in the present case

Appendiceal calculus may have to be differentiated from ureteric stone, renal stones, calcified mesenteric lymph nodes, phleboliths, barium residue, calcified appendix epiploica, calcified fibroids of ovarian cyst, foreign bodies, stone in caecum and Meckel's diverticulum and gallstones in a low lying gall bladder Candy (*loc. cit.*) gave a good differentiation between the appendiceal and ureteric calculi A barium meal examination will usually demonstrate nonfilling or partial filling of the appendix

SUMMARY

A case of appendiceal calculus presenting with features of ureteric calculus has been reported.

ACKNOWLEDGMENT

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Complications of Pseudopancreatic Cyst

V. M. SAXENA*, S. C. LODHA**

Pseudopancreatic cyst which contributes to about 80 per cent pancreatic cysts is a rare entity and complications thereof are even rarer. The rupture of the cyst into the peritoneal cavity or into a hollow viscus and haemorrhage inside the cyst are amongst the common complications

When the rupture occurs in the alimentary tract temporary or permanent cure may be expected whereas the rupture in the peritoneal cavity is usually associated with a high mortality. Most of the authors suggested different types of ruptures

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and from their reports it appears that the rupture can occur with equal frequency into a hollow viscus or into the peritoneal cavity. Hess and Rutte (1950) estimated that about 5 per cent of pancreatic cysts ruptures spontaneously. The cases of intraperitoneal rupture, now reported, are further examples of this complication with a fatal outcome.

CASE REPORTS

Case 1:

D. R., 35 years, Hindu male, was admitted to S. M. S. Hospital on 21-8-1970, with the complaints of pain in the epigastric region for 15 days, lump in the upper abdomen for eight days The patient stated that he had an injury following a fall from a cycle rickshaw about 2 months ago, was admitted in the hospital for epigastric discomfort and was under treatment for 20 days and later discharged About eighteen days prior to re-admission he had severe epigastric pain which was associated with frequent vomiting and radiation to the back in lower interscapular region, and subsequently he developed a lump in the upper abdomen

On admisson, general condition was low, the patient was anaemic with pitting oedema over the feet There was a cystic swelling (6"×8") midway between the umbilicus and the xiphisternum, separate from the liver and was not moving with respiration Keeping in view the previous history a tentative diagnosis of pseudopancreatic cyst was made.

Investigations showed Hb —6 g per cent with total and differential counts within normal limits; total proteins 4.3 g. per cent with A/G ratio 2 1/2 2; serum bilirubin 1 mg. per cent, serum amylase 200 Somogyi units/100 ml. and urinary diastase 20 units Barium meal examination confirmed the diagnosis of pseudopancreatic cyst.

The patient was being prepared for surgical interference but suddenly on 7-9-1970 at 9-30 p m he developed severe pain in the epigastric region which was associated with vomiting and profound shock; on examination the pulse and blood pressure were not recordable, abdominal mass had disappeared and there were signs of generalised peritonitis. A diagnosis of spontaneous rupture of pseudopancreatic cyst was made, attempts to treat shock failed and the patient died on 8-9-1970 at 3-45 p.m.

Case 2:

R. M., 38 years, Hindu male, was admitted at M. G. Hospital, Jodhpur on 10-12-1969 with complaints of a lump in the epigastric region. The patient gave the history that he had a bullhorn (blunt) injury in the abdomen about a month back. He was treated at the district hospital for fracture of the left lower ribs and was relieved, subsequently he developed a gradually increasing swelling in the epigastric region and on admission the patient was found to be of fair build and to have a cystic swelling 5"×4" in the epigastric region.

The patient was examined by a number of medical students in the evening At about 8-00 p.m. he suddenly developed severe abdominal pain and went into shock, the lump had disappeared and signs of peritonitis were present.

Initially, the patient responded to treatment and later developed ascites in 3 days time, tapping was performed and the fluid was sent for routine examination and for pancreatic enzymes, the amylase content of the ascitic fluid was 1200 Somogyi units/100 ml Before the laboratory report was received a simple bedside test was performed to detect the presence of amylase in the ascitic fluid which was positive. Later, patient's general condition deteriorated and he left the hospital against medical advise before any help could be rendered to him

DISCUSSION

Pseudopancreatic cysts are uncommon pancreatic lesions Howard and Jordan (1960) noted an overall incidence of 0.007 per cent of the hospital admissions while Rosenberg *et al* (1969) noticed the incidence of about 2 per cent as a complication of acute pancreatitis Because of the rarity of the disease the problem is only seldom met with in surgical practice.

Spontaneous rupture is probably the commonest serious complication Hess and Rutte (*loc cit.*) reported the incidence of 5 per cent of this dreadful complication; however, Hanna (1959) who was able to collect 45 cases in the world literature estimated that the actual percentage was probably much lower The mortality of this complication quoted by above authors is as high as 50 per cent whereas Becker *et al.* (1968) and Rosenberg *et al* (*loc. cit.*) reported a mortality of 20 per cent and nil in their series o 10 and 4 cases respectively.

Rupture of pseudopancreatic cyst can occur int the abdominal viscera as well as into the free perit neal cavity. The diagnosis of rupture in the alimen tary tract is based on the disappearance of th abdominal tumour followed by a bout of diarrhoe and sometimes recurrence and remission of such swelling with severe diarrhoea preceding ea remission is the diagnostic criterion for intralumin rupture (Parson, 1857; Payr, 1898). Hess and Ru (*loc. cit.*) and Opie (1910) suggested that the dischar of the contents may occur through one of the pancreatic ducts communicating with the cyst. Rupture of the cyst has been reported in the stomach, duodenum and colon (Reinhardt, 1916; Favre and Chippaux-Mathis, 1949; Murray, 1958). The other probable ruptures 'into the renal pelvis, retroperitoneal tissue and biliary tract have also been reported in the literature.

When the rupture in the alimentary tract is associated with haemorrhage which manifest in the form of melaena and haematemesis the prognosis is grave, otherwise uneventful recovery is expected

Intraperitoneal rupture is heralded by severe peritonitis, peripheral circulatory failure and shock This may or may not be associated with a history of injury Palpation by the surgeon, prior to surgery, has ruptured several cysts (Stephenson, 1957 cited by Hanna, *loc. cit*)

The cases cited above manifested with one of the above mentioned complications in which the cyst ruptured into the free peritoneal cavity, the diagnostic criteria in case 1 was based on clinical and radiological studies, whereas in case 2 the cyst had probably ruptured during clinical examination and the patient showed signs of abdominal distress, peritonitis and subsequently developed ascites which recurred after tapping

We feel that in such undiagnosed and obscure cases the diagnosis can be confirmed by the presence of various pancreatic enzymes in the ascitic fluid and suggest a simple bedside test based on the presence of amylase

The test is as follows: 5 ml. of ascitic fluid with a pinch of starch is boiled for 1 minute and the presence of digested starch is tested by putting a drop of iodine. If the colour of the solution remains unchanged then this indicates that the starch has been digested and the fluid did contain amylase. Conversely, if the solution turns blue then this indicates that the starch has not been digested and the fluid did not contain amylase.

The treatment of pseudopancreatic cyst by one of the drainage procedure should be done reasonably soon after the diagnosis is established, keeping in mind its dangerous complications and subsequent consequences. It usually takes about six weeks for the wall of the cyst to get thickened and mature and the inflammation to subside in order to obtain a satisfactory anastomosis. Cerilli and Faris (1967), in a series of 16 cases, emphasised less complication and lower mortality rate when the operative procedure was undertaken after six weeks of the cyst formation as compared to high mortality of 60 per cent and morbidity of 80 per cent in cases where the surgical interference was done before six weeks.

SUMMARY

Two cases of intraperitoneal rupture of pseudopancreatic cysts are discussed along with the review of literature, a simple bedside diagnostic test in obscure cases is suggested

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Investigation of Jaundice

The critical decision in every case of jaundice is whether or not operation should be advised The temptation to operate is irresistible when patient presents with deep jaundice accompanied by bilirubinuria Laparotomy under general anaesthesia can be dangerous in severe hepatitis and it is equally tragic not to operate on a patient suffering from jaundice due to an impacted stone in the bile duct This calls for that each and every case of jaundice should be critically analysed, based on sound clinical experience By using clinical judgement it will be possible to diagnose correctly in 80 to 90 per cent of the cases of jaundice but in the remaining cases even the most experienced may be misled by symptoms and signs peculiar to one type present in the opposite group of cases It is therefore, essential to use all ancillary aids to diagnosis, such as radiology, liver biopsy and liver function tests

Clinical analyses of cases with jaundice met in surgical practice showed that 51 per cent were due to stone in the common bile duct, 25 per cent due to malignancy in pancreas or periampullary region or of the common bile duct itself and 13 per cent due to various other causes[1]. Although early differentiation into 'surgical' and 'medical' jaundice is often easy many baffling cases do exist The classical symptoms of jaundice, pale stool, bilirubinuria and absence of urobilinogen in the urine are not constant. Cholestasis is defined as stagnation of bile within intrahepatic and extrahepatic biliary passages (extrahepatic cholestasis), or intrahepatic passages alone (intrahepatic cholestasis) In both certain pathological changes are common. The clinical syndrome of cholestasis comprises jaundice of an obstructive type with pale stool, dark urine, itching and enlarged liver In the blood conjugated bilirubin levels are raised along with rise in the levels of bile salts, alkaline phosphatase and lipids In both groups of cases, intra as well as extrahepatic cholestasis, there is pale stool due to absence of bile pigments in the intestine along with malabsorption of fat soluble vitamins particularly vitamin K[2] Intrahepatic cholestasis occurs in viral hepatitis and after the use of a wide variety of drugs like chlorpromazine and other phenothiazine derivatives, chlorpropamide, P A S methyl testosterone and anabolic steroids such as norethandrolone

Four or five simple tests are essential and usually sufficient to confirm the diagnosis establish the cause and indicate severity of liver damage[3] Detection of urobilinogen estimation of serum bilirubin (total conjugated and indirect), serum alkaline phosphatase, prothrombine time and turbidity tests along with examination of stool for occult blood and certain radiological examinations are very useful A good soft tissue film should demonstrate an enlarged liver or spleen or any radio opaque gallstone A barium meal examination may show widening of the duodenal loop from cancer of the head of the pancreas or a neoplastic lesion in the alimentary tract if the jaundice is due to secondaries. In presence of jaundice, oral cholecystography and intravenous cholangiography are valueless as the dye cannot be excreted by the liver in sufficient amount to cast a shadow. The percutaneous transhepatic cholangiography, under the circumstances, can be a very useful aid to the diagnosis. In still doubtful cases liver biopsy may play some useful part as the appearances of intrahepatic cholestasis can be distinguished from those following blockage of main bile passages.

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Estimation of liver enzymes in patient suffering from jaundice are now being carried out more frequently not only to help the diagnosis but also to find out the severity of liver damage. Serum alkaline phosphatase level denotes alkaline phosphatase activity of the intestinal and hepatobiliary source on one side and the ability of the liver to excrete these phosphatases in the bile on the other side. It is widely accepted that values of over 30 K.A. unit/100 ml. favour posthepatic jaundice.

Serum glutamic oxaloacetic transaminase (S.G.O.T.) and serum glutamic pyruvic transaminase (S.G P.T.) estimations are also useful diagnostic aids as elevated values occur in hepatic jaundice at early stage ; but these values are also raised in the later stage of obstructive jaundice Elsewhere in this issue of the Journal the results of enzymatic studies in surgical jaundice clearly show higher level of both S.G.O T. and S.G P.T. in cases with obstructive jaundice[4]. Serial estimations of the level of these enzymes following operations show that with the improvement of jaundice the levels do fall, thereby indicating an improvement of the liver function. Estimations of S.G.O.T. and S.G.P.T. at an early stage of jaundice do differentiate between surgical and medical jaundice, but its estimation in a known case of surgical jaundice has yet to be determined. S.G.P.T. is more specially related to the liver as S.G.O.T. is raised in myocardial infarction and a wide variety of extrahepatic diseases, thus limiting its usefulness as a diagnostic test in jaundice[5].

There are certain other tests, like bromsulphthalein (B.S.P.) excretion, Rose Bengal excretion labelled with I^{131} and Cobalt 60 vitamin B_{12} administration and scanning of the liver to pick up metastases, also being employed now. Early results are promising but the values of these tests have yet to be fully assessed.

In spite of having so many different types of tests for liver function, it has been realised that the ideal liver function tests have not yet been produced. Accordingly it has now become customary to use a group of tests and critically analyse the results and then come to a definite conclusion so that surgical jaundice can be more effectively differentiated from medical jaundice. It has been widely accepted that a patient presenting with clinical jaundice, pale stool, itching, raised serum bilirubin particularly the conjugated one, with absence or trace of urobilinogen in the urine, high serum alkaline phosphatase level with lower value of turbidity tests and almost a normal blood protein should seriously be taken as a case for surgical exploration. To depend solely on the various laboratory tests for the differentiation of surgical jaundice from the medical one is often misleading. Alone none of these tests is diagnostic but combined and aligned to the clinical findings, they serve as a valuable aid to the clinical problem of jaundice[6].

ASOKE BANERJEE

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CURRENT MEDICAL LITERATURE

Drug Interactions

DUNLOP, D (*Community Health*, 4 8, 1972) from Saxe-Coburg Place, Edinburgh, EH3 5BP, writes

In the case of most drugs there is a fairly wide margin between their therapeutic and toxic doses The fact that so many clinical drug interactions seem to involve either oral hypoglycaemic sulphonylureas or anticoagulants may be due to the facts that the therapeutic/toxic ratio of these agents is relatively narrow and the effect of their overactivity becomes quickly and dramatically obvious in hypoglycaemia or haemorrhage It may well be that many drug interactions with less striking repercussions pass unnoticed As regards inhibition of drug metabolism we should be particularly chary of prescribing other drugs simultaneously with monoamine oxidase inhibitors

Alcohol, which has been used since the time of Noah, is still, with the exception of nicotine and caffeine-containing beverages like tea and coffee, far the most commonly used drug in the western world It is appropriate, therefore, to end this consideration of drug interactions by emphasising how common it is for alcohol to influence the action of other drugs and to have its own action affected by them Reference has been made already to the intolerance to alcohol produced by disulfiram (Antabuse) and other drugs which inhibit its metabolism In its turn alcohol potentiates, probably in the same way, the effect of other drugs such as barbiturate and non-barbiturate hypnotics, antihistamines, tranquillisers, narcotic analgesics, antidepressants, and so forth These interactions are particularly important for the motor-car driver as such combinations have profound effects on alertness, judgement, and co-ordination

With the increasing potency of our therapeutic agents an ever-increasing danger attends their combined use either by the prevention or excessive intensification of each other's actions Nevertheless, we should be very chary of administering a variety of potent drugs contemporaneously unless we know what we are about

Mortality from Cancer of the Cervix in Louisiana, 1960-1970

NEWELL, G R and STANCLIFF, E K (*J Louisiana State Med Soc* **124** 280, 1972) from the Department of Epidemiology and Biostatistics, School of Public Health and Tropical Medicine, Tulane University, state

Carcinoma of the cervix has several interesting characteristics that make it particularly suitable for special consideration Epidemiologic patterns of this disease suggest that more cancer of the cervix is associated with sexual promiscuity and with multiple sexual partners, it is associated with low socio-economic status: it shows marked ethnic variation, mortality rates have generally declined in the United States during the last three decades Pathologically, four phases of development of epidermoid cervical carcinoma are recognised carcinoma *in situ*, covert invasive carcinoma, overt carcinoma and metastatic carcinoma Considering the epidemiology and pathology of cancer of the cervix, preventive measures for eradicating the clinical forms of this disease could assume two forms

1) Reducing the incidence of the disease, that is preventing the early pathological changes before they occur, and 2) detecting early cancer of the cervix before it has progressed to a clinically important stage

Based on the findings of this report, the following points regarding cervical cancer deaths in Louisiana seem evident

1) Of the deaths that occur each year (160 in 1970), most of them are potentially preventable were an adequate programme of early detection established

2) Deaths occur three times more frequently in non-whites than whites, so that these women should be the target population for a screening programme

3) Among women under the age of 45 there were 30 deaths (18 8 per cent of the total number) so that young women should be included in a screening programme, as well as older women

4) For whites there has been only a slight decrease in deaths during the past 11 years and in non-whites there has been no decrease, so that a screening programme within the state does not exist that has had a substantial effect on mortality Whether or not detection programme are, in fact, picking up newly diagnosed cases earlier cannot be evaluated from these data

5) The findings suggest that something may have happened around or prior to 1965 which could have effected a decrease in mortality in 1967, but this effect was not sustained

6) Substantial variations in deaths occur within regions of Louisiana but these are not related to the level of available health care as measured by physicians and hospital beds More intensive study of these variations might be worthwhile

7) The deaths among single and divorced non-white women suggest more sexual promiscuity among this group This is known to increase the risk of cervical cancer so that educational efforts directed towards this might be useful in a preventive programme

8) Factors associated with poverty are strongly correlated with cervical cancer deaths Further delineation of these factors followed by their alleviation could prevent a substantial number of deaths from this disease

Oral Diazoxide in the Treatment of Severe Toxaemia of Pregnancy

POHI, J E F, THURSTON, H, DAVIS, D and

MORGAN, M. Y (*Brit. Med. J.*, **2**: 568, 1972) from the Departments of Therapeutics, Medicine and Endocrinology, Manchester Royal Infirmary, Manchester 13, and of Obstetrics and Gynaecology, St. Mary's Hospital, Whitworth Park, Manchester 13, comment:

Treatment with oral diazoxide for periods of 4 to 10 weeks in hospital allowed adequate control of hypertension with continuation of foetal growth in four patients with severe toxaemia. Two were insulin-dependent diabetics and one of these suffered from renal failure. In all patients albuminuria diminished markedly, while the fluid retention was controlled with frusemide. Three pregnancies were successfully terminated by lower segment caesarean section and in the remaining case vaginal delivery resulted in the birth of a healthy baby. Control of blood sugars presented no problems in the diabetic patients. Only minimal adjustments of insulin dosage were required. One of the non-diabetic patients developed mild hyperglycaemia which responded to tolbutamide. The babies, ranging in age from 5 to 12 months, have continued to thrive

Polymer-Fume Fever

WILLIAMS, N. and SMITH, F. K (*J. Amer. Med. Ass.* **219**. 1587, 1972) from the Department of Community Health and Preventive Medicine, Jefferson University, Philadelphia; and the Radio Corporation of America, Camden, N J observe.

Polymer-fume fever, which is characterised by a tight, gripping sensation in the chest associated with shivering, sore throat, pyrexia, and weakness, is rarely reported in the literature. It follows exposure to the pyrolysis products of polytetrafluoroethylene (PTFE) during heating of machining the polymer, or contamination of cigarettes and pipes The patient described here suffered more than 40 attacks during a nine-month period, as a result of contamination of cigarettes. The cause of the fever was not recognised for a long time. Lassitude persisted for several months after the last episode, but no evidence has been found of any permanent ill effects. Polymer-fume fever should always be included in textbook lists of causes of fever of unknown origin

The Effect of Diet on Bowel Transit Times

HOLMGREN, G O. R. and MYNORS, J. M (*S. Afr. Med. J.*, **46**: 918, 1972) from the Department of Surgery, Harari Central Hospital, Salisbury, Rhodesia, write:

A theory has been propounded by Cleave and Campbell that several diseases that are prevalent in Western communities are due to the ingestion of refined-carbohydrate foods. Walker* postulated that one of the effects of such a diet is a slowing in bowel transit time.

This theory has been tested in a study where the transit times of 310 subjects with three different types of food have been measured. The study has shown that subjects on a traditional African diet of mainly unrefined carbohydrate have the shortest average transit time (14.5 hours), those on a Western diet with a high refined carbohydrate intake have the longest average transit time (18.4 hours), and those on a mixed are in-between (20.6 hours).

Gastrectomy and Secretory Function of the Stomach

ISHIMORI, A., SAKURADA, H. and YAMAGATA, S. (*Tohoku J. Exp. Med.* **107**: 1, 1972) from Department of Internal Medicine, Tohoku University School of Medicine, Sendai, comment:

The secretory function of the remnant of the resected stomach together with the proteolytic activity of urine was compared among various types of gastrectomy in reference to the site and the degree of resection and to atrophic gastritis in the remnant. The surgical removal of pyloric antrum was found to lower or lose the proteolytic activity of gastric juice at pH 3.5 or higher, but not of urine. Atrophic gastritis in the remnant of the resected stomach was also found to influence the acid and protease secretion of the stomach in the parallel manner, but this is less clearly seen in the proteolytic activity of urine. The step-wise dissociation between acid and protease secretion and between synthesis and secretion of protease was demonstrated as the characteristic feature of the functional disturbance of the stomach due to atrophic gastritis. namely, the abolition of acid secretion precedes that of pepsinogen secretion and then pepsinogen continues to be synthesised and excreted into urine after the cessation of its secretion into the gastric lumen. The difference of the inborn resisting capacity among different types of secretory cells was suggested as an important contributing factor. The importance of the simultaneous measurement of the gastric and urinary proteolytic activity was stressed in order to evaluate the histologic and functional status of gastric mucosa precisely. The secreting secretory cell mass was proposed to represent reasonably the gastric secretory response obtained by the maximal stimulation.

Australia Antigen

COOKSLEY, W. G. E. (*Med. J. Aust.*, **2**: 477, 1972) from the Department of Medicine, University of Queensland, Royal Brisbane Hospital, Brisbane, writes:

The more recent developments in knowledge of the Australia antigen are reviewed, particularly those of clinical importance. The role of antigenaemia in acute and chronic hepatic disease, and in primary liver cell cancer, as well as its association with non-hepatic disorders of the serum sickness type such as polyarteritis nodosa, arthritis, glomerulonephritis, and urticaria, is discussed. Although it is now accepted that the "carrier" state in blood donors is frequently associated with symptomatic but nevertheless often serious liver disease, the natural history of the disease in these "carriers", and therefore management, is less clear. Furthermore, the greater risk of infection with the serum hepatitis virus in laboratory and medical staff due to their exposure must be minimised.

Current ideas on the pathogenesis of the disease are outlined, since they may influence principles of treatment, prognosis and prophylaxis Finally, the uncertainty surrounding the possible development of chronic liver disease after attenuation by immunisation has added a note of caution to immunisation studies. Although disease associated with Australia antigen appears in general no different in Australia from that elsewhere, this country is fortunate in that it enjoys a lower incidence of antigenaemia and its associated diseases than that found in many other countries.

Respiratory Symptoms and Ventilatory Function Changes in Relation to Length of Exposure to Cotton Dust

ZUSKIN, E. and VALIC, F. (*Thorax*. **27**: 454, 1972) from Andrija Stampar School of Public Health, Zagreb University, Zagreb, Yugoslavia, observe

The prevalence of byssinosis, respiratory symptoms, acute changes of ventilatory capacity over the shift, and chronic changes of ventilatory capacity were studied in two groups of non-smoking female workers exposed to practically identical concentrations of the same type of cotton dust but for very different periods of time (16 and 4 years respectively). The prevalence of non-specific respiratory symptoms increased with the duration of exposure to cotton dust only in the subjects with byssinosis Exposure to cotton dust caused significant reductions over the shift of the mean FEV 1 0, FVC and PEF in all the groups of cotton workers examined. In byssinotics the reduction in ventilatory capacity was considerably greater in subjects with longer than in those with shorter exposure to cotton dust, while in non-byssinotics the response was approximately equal in the two groups. Inhalation of a bronchodilator at the end of the shift restored ventilatory function to its pre-shift values except in byssinotics with a longer duration of exposure to cotton dust. Chronic changes of ventilatory capacity developed only in subjects with a longer exposure to cotton dust and were common in the bysinotics.

Serum Enzyme Levels in Diagnosis of Postoperative Myocardial Infarction

WATKINS, S. M. and LEWIS, A. (*Brit. Med. J.*, **3**: 733, 1972) from Royal Free Hospital, London N W. 3, observe:

The levels of creatine kinase, hydroxybutyric dehydrogenase, and aspartate transaminase have been serially measured in the serum of patients undergoing surgery. Serum enzyme levels often rose to a range commonly found after myocardial infarction but fell to normal within 5-10 days. Raised serum enzyme levels have no diagnostic significance in a case of postoperative chest pain until after the fifth postoperative day, but may be significant thereafter.

Treatment of Myasthenia Gravis with Prednisone

JENKINS, R B (*Lancet*, **1**. 765, 1972) from the Section of Neurology, Washington Hospital Center, Washington, D C 20010, U S.A, states:

Eight patients with severe generalised myasthenia gravis and one with ocular myasthenia gravis have been treated with predonisone for between 6 and 25 months Strength returned to normal or almost normal in the limb and trunk muscles of seven of the eight patients with generalised weakness and improved slightly in the limb and trunk muscles, with greater improvement in the respiratory muscles, of the other patient. Strength decreased during the early phase of treatment in two patients who later showed great improvement, but in one of them ocular and pharyngeal weakness have persisted and one has had relapses. The patient with purely ocular signs lost them Prednisone was given on alternate days, but it may be advisable to give it more frequently at the start of treatment.

NOTES AND NEWS

13 Million Suffer from Mental Diseases

About 13 million of the country's population suffer from mental diseases, according to Dr P. N Wahi, Director-General, Indian Council for Medical Research.

Dr Wahi, who was inaugurating a four-day seminar on research methods in psychiatric epidemiology at the Agra Mental Hospital, said the incidence of mental disorders was of the order of 23 79 per thousand.

Dr. Wahi believed that the main cause of the high rate of mental diseases in the country was the social strain caused by rapid industrialisation

States Asked to Survey Leprosy Cases

The Centre has asked State Government to undertake sample survey on the incidence of leprosy cases, the Deputy Health Minister, Mr A K. Kisku, recently told the Rajya Sabha

Replying to Mr P S Patil, the Deputy Minister said that though 1971 census reported about 3.1 million leprosy cases there was no evidence to show any increase of such cases in any of the States.

Every Third Blind Person an Indian

Inaugurating a multi-purpose project, including an eye-camp, organised by the Indian Council of Social Welfare, Mr. John Wilson, Director Royal Commonwealth Society for the Blind said at New Delhi that of the total world blind population of 1.5 crores every third blind person was an Indian. This blindness was preventible and other countries could draw inspiration from the success of the Indian experiment with the institution of eye camp in rural areas. The Royal Commonwealth Society for the Blind was planning a massive "Eyes for India Campaign" and would cooperate with Indian agencies working for the welfare of the blind, he said

E.E.G System for Testing Small Children's Hearing

A new EEG system which allows doctors to gauge the hearing capacity of small children and the mentally handicapped—those who do not respond to conventional methods—has been developed by Mr. Torsten Andersson at Vipeholms Hospital, Lund, reports the Swedish magazine *Ny Teknik*

A small helmet-like device, to which electrodes are attached, is placed upon the subject's head EEG signals are induced in the brain by means of audio-stimulation and these are registered on a combined receiver/transmitter From there they are relayed to a receiver which stands in direct contact with a mini-computer.

The new system, which is thought to be the first of its kind in the world, has a range of 200 metres, which means that the patient can move about unhindered during the test, *Ny Teknik* says

The system is still only in proto-type form, it is stressed, and the inventor is now in the process of developing a new and more sophisticated apparatus which will allow eight separate brain activities to be registered simultaneously

Saltpetre Purifies Cigarette

Saltpetre in cigarettes reduces the cancer-causing effect by some two-thirds, according to a West German Cigarette Research Institute

Prof Walter Dontenwill, the head of the institute, claims this after three years of experiments on over 13,000 white mice and Syrian hamsters His findings show that 10 6 per cent of the Syrian hamsters forced into the role of chain smokers were found to have cancer of the larynx at the end of the experiment

This proportion dropped to 2 5 per cent in a group treated with cigarettes containing saltpetre and went further down to 0 6 per cent where cigarettes with acetate filters were used

T. V Impairs Child's Brain Cells and Vision

The sight modulation of most children under the age of five is not equipped to cope with the dazzling brightness and vibrations of a television programme, says Dr Manuel Suarez Perdeguero, President of the Spanish Paediatrics Association and Dean of the Medicine Faculty at Seville University.

Dr. Suarez says that tests in his Paediatrics Department at Seville have shown that a child's brain cells and vision can be permanently impaired if he is exposed to television at an early age.

The damage to the cells is both structural and chemical. The cells undergo a change in their structure and chemical make-up which, though slight, definitely affects the child's normal intellectual development.

'Parents who allow their youngsters to sit for long hours in front of the television screen are committing a form of mental aggression", said Dr. Suarez. This is caused primarily because a child under five is unable to understand fully what is being shown on the screen, Dr Suarez argues

9th International Congress of Psychotherapy to be Held in Oslo

The Ninth International Congress of Psychotherapy takes place in Oslo on June 25-30, 1973. The main theme is. What is psychotherapy? The congress structure allows for invited speakers, but the main emphasis is on group work, panel debates with panellists from all over the world and symposia on special subjects About one thousand particepents are expected Congress fee Nkr 500 (ca US $70). Detailed information may be had from General Secretary, Dr Finn Magnussen, Box 26 Vinderen, Oslo 3, Norway Registration deadline is *March 15th, 1973.* Correspondence regarding accommodation, registration, holiday tours, etc, should be addressed to. University of Oslo Congress Service, Box 55, Blindern, Oslo 3. Cabel Unitravel Telex 11906

Medical Council of India, Third Silver Jubilee Research Award, 1974

The Management Committee of the Medical Council of India Silver Jubilee Research Award Fund has decided to make its Third Award in 1974. The Award which will consist of a cash prize of Rs 50,000/- and a Gold Medal of the value of Rs. 1,000/-, will be given to one whose work in India is adjudged to be the best and original and which would be beneficial for the greater good of humanity at large.

The nominees have to fulfil the following conditions

1 Citizens of India and others who have done their research in India will be eligible for nominations
2 Conclusions of particulars of the original research submitted by the candidates must have been arrived at during the previous 5 years.
3 (a) The original research should be for the greater good of humanity at large.
   (b) The original research work submitted should be of an outstanding contribution.
4 The original research submitted by the candidate for the Silver Jubilee Research Award should not have been presented for any other award elsewhere
5 The committee reserves the right to withhold the award if the original research work presented is

not of a high order.

6. In case of a joint research work, the award shall be divided between the workers in such proportion as may be decided.

The Nominations of the Award are now open and the Nomination Forms can be obtained from the Secretary, Medical Council of India, Silver Jubilee Research Award Fund, Temple Lane, Kotla Road, New Delhi-1. The complete nominations should be submitted to the Secretary of the Award Fund by *30-5-1973.*

Doctors in the News

Dr. Paramesh Kumar Kar, member of the Journal Committee of J.I.M.A. and Hony. Treasurer, I.M.A., Calcutta Branch, has been elected to the Academic Council of the Calcutta University from the constituency of teachers of constituent colleges.

Dr. Dinabandhu Banerjee, member of the Journal Committee of J.I.M.A. and a member of the Working Committee of I.M.A. (Central), has been elected to Senate of the Calcutta University from the Registered Graduates' Constituency.

Dr. Jayasree Roy Chowdhury, Officer-in-charge, Department of Cell Biology, Chittaranjan National Cancer Research Centre, Calcutta, has been selected for Raja Ravi Sher Singh of Kalsia Memorial Cancer Research Award for the year 1972 This award is in recognition of Dr. Roy Chowdhury's outstanding contribution on the studies on the changes in the cancer cell both at the cellular, sub-cellular and cytochemical levels.

It may here be mentioned that Dr. Roy Chowdhury got this award also in 1966 for her work in experimental and clinical aspects of cancer research

CORRESPONDENCE

Consulting Physician

SIR,—I have got a few doubts regarding the nomenclature consulting physician. I will be thankful if any one of your esteemed readers clears my confusion as to when to call a particular physician a consultant in a specialised branch of medicine I would like to explain my problems as follows:

1. A doctor, who has passed his M B B S. examination, undergone house surgeoncy for one year and senior house surgeoncy for another year, later joins postgraduate course in general medicine. He undergoes 2 years training completing the terms, but is prevented by circumstances from taking his exam. and subsequently enters a consultation practice. I mean, starts consultation practice only in general medicine. He does not see gynaecological or surgical cases, does not dispense medicines or administer injections, but keeps regular case records as he gets cases referred by other doctors etc. Within a short time he makes a name as a good physician. In short, everything is done or maintained by him just like any other consulting physician except that he does not possess a postgraduate degree, though he had received 2 years postgraduate training in general medicine under a director of postgraduate studies. Can this particular doctor be called as a consulting physician ?

2 A doctor who does not have a postgraduate degree is much interested in electrocardiography. He has mastered electrocardiographic interpretation by himself through patient study of electrocardiography. His professional colleagues seeks and attach due importance to his opinion regarding any difficult cardiograms Can this particular doctor be called a consultant in electrocardiography ? Here I would like to draw your attention to a book on Differentiation between Normal and Abnormal in Electrocardiography by Ernst Simonson, where the author introduces himself as consultant in electrocardiography, even though he is a professor of physiological hygiene.

I am, etc,

Town Clinic, South Bazar K P MUSTHAFA
Cannanore-2

Rural Health Scheme

SIR,—As a medical man who has worked all his life in rural areas I am amazed to read about the rural medical scheme proposed to be launched by our government on a national scale for rural medical care. The scheme, we are told, will be implemented in three years and is intended to mobilise 250,000 registered medical practitioners in the traditional systems of medicine and homoeopaths

The already overtaxed countrymen will have to foot a bill of expenses to the tune of Rs 150 crores over this fantastic scheme with huge recurring expenses to follow.

From my 50 years experience as a Medical Officer and a practitioner in different rural areas of U.P., I can unhesitatingly say that there is no dearth of the kind of practitioners our government propose to mobilise under this scheme

A person with a few months of training will be no better than the very large number of practitioners we have already got in our villages and small towns. It is stated that they will be required to treat ordinary cases and they will refer and send the complicated ones to the nearest hospital Here is the rub. Who will decide which is a complicated case and which is not? My long experience has convinced me that such practitioners will seldom be able to diagnose complications Besides, human nature being what it is, these practitioners are ever reluctant to confess their inability to treat serious and complicated cases and thus lose face before their clients. They give up the cases in hand only when things turn for the worse. Moreover they prescribe all sorts of scientific medicines and injections (often disguised) knowing little about the composition, actions, contraindications and toxicology of the same with the result that often instead of improving the patients suffer from toxic symptoms. As there are many of such practitioners, patients turn from one to another with no better result. I can assert from my practical experience that these practitioners are doing more harm than good by giving medicines unnecessarily and injudiciously to our poor simple village folks. A huge quantity of medicine is being misused, abused and wasted resulting in a colossal loss of the national wealth. Our government wants to perpetuate this unhealthy practice by granting licences (after a semblance of brief training) and employ them to caters medicines to our poor villagers.

It seems that those at the helm of affairs do not realise that the main cause of illness in rural areas is want of proper and adequate food, wholesome water and sanitation. It is not possible to prescribe milk, curd, butter, fruits, eggs, and often even vegetables, as these have become too expensive. Is it any wonder that we have got such big increase in deficiency diseases? we hear of quite a number of people dying of diseases due to slow chronic starvation and lack of protecting clothes in bitter cold. It would be foolish to feed them with medicines when what they need is nourishment It would be sheer waste of money to let loose 250,000 practitioners, who in actual practice will be no better than vendors of all sorts of medicines. Our country does not need doctors of diseases. We have already got too many of them—too many Medical Colleges—too many Vaids—too many Hakeems and any number of Homoeopaths and others of hotch potch brand, who administer all kinds of nostrums to the simple village folks

What we need are doctors of health who will undertake vigorous educative and practical scientific steps for the prevention of diseases in rural areas. But more than this the crying need is to adopt all possible measures to bring down drastically the prices of all basic articles of food so that a poor man earning say Rs. 100/- per month can make both ends meet and feed well his family of five including his children—leave alone his old parents.

We can not deny that we have ignored the sufferings of our poor people in villages. It is true that big farmers have prospered due to increase in their harvest and good return due to tremendous increase in price. But such farmers are less than 10 per cent. The rest are all poor and ill-nourished. This army of 250,000 practitioners will be more a liability than asset. They can not solve the problem of poverty, the awfully high cost of living and consequent ill health.

I am, etc.,

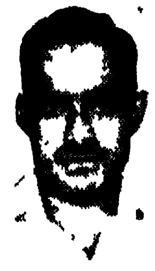
Village Hospital
Najibabad, U.P.

P. D. GUPTA, M.S.M.F.,
F.C.G.P., P.M.S. (Retd.)
Medical Superintendent

OBITUARIES

Dr. B. Pal

Dr. Bhadreswar Pal, a popular general practitioner of Andul in the Howrah District of West Bengal, passed away on the 3-1-73. He had been suffering from high blood pressure.



DR. B. PAL

Son of late Dr. Upendra Nath Pal, Dr. Pal began his medical career after passing the L.M.F. (Bengal) examination in 1946. He went to Rangoon in 1953 and served under the then Government of Burma as a medical officer at Mandalaya. He left Burma in 1956 and returned to his native place in 1956 and buit up an extensive practice. He was also attached to the E.S.I. Scheme.

Dr. Pal was one of the active and energetic members of the local branch of I.M A. and he worked untiringly for its all-round progress. He was respected and loved by the people of an wide area for his amiable disposition and qualities of head and heart

Dr. Pal has left behind his aged mother, wife, only son and two daughters.

Dr. Kursheed Husain

Death occurred on 17-1-73 of Dr. Kursheed Husain, a member of the I M A., Hyderabad City Branch.

Dr. Husain obtained his medical qualifications from the University of Edinburgh and returned to Hyderabad in 1914. He was appointed Civil Surgeon of Raichur district and after a few years of meritorius service in that capacity he caught the attention of the Nizam family which brought him to Osmania Hospital where he served as First Surgeon for some years. Later he was promoted as Professor of Ophthalmology and Surgery at the Osmania Medical College to which he was attached till his retirement. He was also appointed surgeon to the Royal Nizam family.

Besides his brilliance in the surgical field, Dr. Husain had to his credit a number of publications on both medical and other topics. He also had the honour of presiding over the All-India Surgeons' Conference held at Hyderabad in the early sixties.

Dr. Husain, who was a philanthropist and a man of principles, lived to be 91 years. He leaves behind five sons and two daughters.

SUPPLEMENT
JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

VOL. 60, No. 5 CALCUTTA MARCH 1, 1973

Association Notes

Hony. General Secretary's Appeal to Members To Make 'Special Contributions Fund' Drive Successful

With a view to strengthening the financial position of the Association by creation of a 'Special Contributions Fund of I M A', Dr P C Bhatla, Hony General Secretary, has issued the following appeal to all I M A members through the Hony Secretaries of the State/Territorial and Local Branches of I M A

It has been felt for sometime that the activities and functions of the Indian Medical Association should considerably expand if the Association has to satisfy the growing aspirations of its members and fulfil their expectations with regard to the needs of the profession

In a developing country like India where there is a constant phenomenal growth in population, the responsibility of the medical profession is always on the increase The Indian Medical Association has endeavoured to consolidate the profession and to make it feel its responsibilities towards the people

Shouldering the increasing responsibilities naturally entitles the profession to more rights and privileges and better working conditions and facilities and the Association has been fighting for the same Although it has succeeded to some extent, it is not enough Concerted efforts to secure to the profession what is its due are needed

The question of intensifying Association's activities and of expanding their field has been engaging the attention of the Working Committee for some time past The Working Committee at its 107th meeting as well as the Central Council of the Association at its 32nd Annual Meeting held at Ahmedabad in December 1972 felt that the financial resources of the Association would have to be strengthened if it was to be called upon to serve better.

The main source of revenue of the headquarters office of the Association is its share of the "Headquarter Fund Contribution" made on behalf of each member Due to rise in wages, prices, etc. this source has become insufficient even to meet the existing commitments The Central Council has, therefore, raised the "H F C" from Rs 13/- per head per year to Rs 18/- per head per year, the headquarter's share out of the increase of Rs. 5/- being Rs 2/- only

To raise finances for enlarging the activities of the Association, the then President, Dr A K N Sinha made a plea at the meetings of both the Working Committee and the Central Council that a time had come when the Association should have a sizeable reserve fund to strengthen its foundations as well as to produce sufficient regular income by way of interest He said that if each member contributed once during his/her membership of I.M.A a sum of Rs. 100/- to such a fund, the Association with a membership of thirty six thousand and odd would immediately have a fund of over Rs 36 lakhs which when invested would yield an annual income of over Rs 2.5 lakhs to enable the Association to expand its activities without troubling members every now and then for raising funds for the purpose Dr. Sinha said that a member could contribute Rs 100/- in one year. Each newly enrolled member should also contribute likewise and this would give an addition of nearly Rs. 5 lakhs to the Fund annually The Central Council appreciated the suggestion and decided as under.

> "A suggestion was made that in order to augment the revenue of the Association the Association should collect a special contribution of Rs 100/- from each member (recoverable in one lump or in instalments in a year) for a fund of the Association, the interest on which could be used for the purposes of the Association
>
> The Hony General Secretary was asked to infom the members accordingly in order to judge the response before the Central Council took a decision of making it a compulsory contribution by each member of the Association"

It is requested that while consensus of members of your branch on the implementation of the suggestion that every member of the I M A should contribute to the Association's Special Contribution Fund a sum of Rs 100/- is communicated to this office in due course, may I make a fervent appeal to the well wishers of the Association—our respected members—to voluntarily contribute a sum of Rs 100/ (in one lump sum or in instalments) during this year The collection for the Fund has already started and few members have already sent their valuable contribution

This gesture on the part of the members in their total involvement in the progressive activities of the Association is highly appreciated Our office will look forward expectantly to receiving similar contributions from each of our members confirming thereby their identification towards the solidarity of the profession under the banner of the I M A

27th General Assembly of W.M.A.

In course of a circular to the Hony Secretaries of all State/Territorial and Local Branches and members of the Working Committee of I M A Dr P. C Bhatla, Hony. General Secretary, I M A states

The 27th General Assembly of the World Medical Association will be held in Munich, Germany, on October 14 to 20, 1973

As a member of the World Medical Association, the Indian Medical Association is entitled to send to the General Assembly

(a) Four Delegates,
(b) Four Alternate Delegates; and
(c) Four Observers

The State/Territorial and Local Branches and members of the Working Committee, I M A, are requested to send in nominations in the prescribed form for the above so as to reach the Headquarters Office by *March 31, 1973* The Local Branches should send the nominations through their respective State/Territorial Branches. The selection will be made by the Working Committee at its next meeting

The nominees must have continuous membership of the I.M.A. for at least 3 years and must have been taking active interest in its affairs and they should be conversant with I.M.A.'s policies.

Neither the World Medical Association nor the Indian Medical Association will pay travel and per diem to any person selected to attend the Assembly under any of the above three categories. It is, therefore, requested that only such persons be nominated who, if selected, will be prepared to meet their expenses.

By an amendment to the Constitution and Bye-laws of the World Medical Association, which was made at the XXII World Medical Assembly (Sydney-Australia, August 5-9, 1968), the voting right in the Assembly are now based upon (a) size of member associations and (b) full payment of dues for the current year. The Indian Medical Association has not been and will not in near future be in a position to pay 100 per cent subscription due from it to the World Medical Association. There will, therefore, be no voting rights to its delegation.

The number of delegates and others will finally depend on the sanction of the Government of India for foreign exchange.

Dr. Sharda Prasad Srivastava Oration

Dr. K. P. Mehrotra, Hony. State Secretary, I.M.A., U.P. State Branch, announces:

Entries are invited for the above Oration which is an annual event initiated by the U.P. State Branch in memory of late Dr. Sharda Prasad Srivastava and is to be delivered at the Annual U.P. State Medical Conference to be held either in the last week of October or 1st week of November, 1973.

The Oration must pertain to some original work or special clinical work and data on any branch of surgery including gynaecology, ophthalmology or radiography. It is open to all medical practitioners of modern medicine and teachers of medical colleges in India or abroad, who happen to be in India at the time, though preference will be given to those who are from U.P.

The orator should submit 6 typed copies of the papers, he or she intends to read by *30th July* this year. He or she shall be awarded a memento besides first class railway fares both ways for journey to the venue of the conference. The oration delivered will be the property of U.P. State Branch of I.M.A. and efforts will be made to have it published in Association's Journal.

All correspondence on the above subject should be addressed to the Hony. State Secretary, I.M.A., U.P. State Branch, 25/58 Phil Khana, Kanpur 1, U.P.

XIII I.M.A. Study Tour to U.S.S.R., Europe and U.K. on May 1-14, 1973

Dr. P. C. Bhatla, Hony. General Secretary, I.M.A., announces in course of a circular (No. F.18(50)//19/72-73 dated 25-1-73) to the Hony. Secretaries of all Local Branches and State/Territorial Faculties of I.M.A. College of General Practitioners:

The Indian Medical Association/I.M.A. College of General Practitioners take pleasure in announcing the XIII-I.M.A. Study Tour to U.S.S.R., Europe and U.K., giving the opportunity to the participants to visit Medical Institutions/Hospitals and to meet colleagues in different countries to share experience and exchange views on current medical topics.

The relevant information about the tour is given below:

(i) *Eligibility:*

The participation in the tour is open only to those who are members of the I.M.A. College of General Practitioners for six months or over. Their families may accompany them. Preference will be given to Fellows and Life Members of the College.

(ii) *Registration:*

The registration of participants will be on "first come first served" basis on receipt of application in prescribed form and a *bank draft* of a deposit of Rs. 200/- per person (Rs. 400/- in the case of a couple).

(iii) *Cost of Tour:*

The cost of the tour is Rs. 5,500/- plus US $85 per person for the tour of USSR, Europe and UK, payable as follows:

(a) Out of Rs. 5,500/-, Rs. 200/- with the application for registration and the balance of Rs. 5,300/- by March 31, 1973.
(All payments by *bank drafts* or in *cash*. No cheques will be accepted).
(b) $85 on start of tour.

This cost includes:

(a) Air fare from India and back to India;
(b) Government of India Foreign Travel Tax;
(c) Airport and Local Taxes;
(d) Visa charges (Visa forms will be sent to the participants after their registration);
(e) I.M.A. Headquarters administrative expenses;
(f) Hotel accommodation in double rooms (with all meals in Moscow and Rome and with Continental Breakfast only in Paris and Munich). Accommodation in London is not included in the cost.
(g) Sightseeing with English-speaking guide in Moscow, Paris, Munich Zurich and Rome;
(h) Transfers on arrival and departure from Airport to Hotel and vice-versa in Moscow, Paris, Munich, Zurich and Rome. In London transfer will be provided from Airport to Victoria Terminal at the time of arrival there. Arrangements for further transport and for boarding, lodging, etc. for the period of stay in London will have to be made by participants themselves at their cost.

(iv) *Itinerary:*

The tour itinerary is as follows:

May 1, 1973	Lv. New Delhi	0830 hours	AI-503
	Ar. Moscow	1540 hours	
May 2, 1973	In Moscow		
May 3, 1973	Lv. Moscow	1810 hours	AF-269
	Ar. Paris	1950 hours	
May 4, 1973	Lv. Paris	1830 hours (Paris Time)	AD-824
	Ar. London	1830 hours (London Time)	
May 4-10, 1973	In London (Participant's own arrangements)		
May 11, 1973	Lv. London	1010 hours	BE-642
	Ar. Munich	1225 hours	
May 12, 1973	Lv. Munich	0945 hours	SR-561
	Ar. Zurich	1030 hours	
May 12, 1973	Lv. Zurich	1945 hours	AZ-403
	Ar. Rome	2105 hours	
May 13, 1973	Lv. Rome	1530 hours	AI-112
May 14, 1973	Ar. Delhi	0510 hours	

(v) *Documentation:*

Each participant will have:

(a) To obtain his/her passport duly endorsed for USSR, UK and all countries in Europe and Scandinavia. Visas will be obtained in Delhi; and
(b) To obtain his/her International Health Certificates against Cholera and Small-pox, duly endorsed with I.S.R. Seal.

(vi) *Foreign Exchange:*

Under the Government of India's Foreign Travel Scheme 1970, a person who has not travelled out of India for the last three years (excluding Nepal, Mauritius and Ceylon), is, if he travels by Air-India, entitled to get foreign exchange equivalent to US $100 for tour abroad, for which he/she has to give a declaration on a specified form. In this tour, air travel will be by Air-India service.

Those who have been abroad during the last three years and those who desire to have foreign exchange, will have to apply themselves for release of foreign exchange on individual basis. *The participants are advised to apply individually to the Reserve Bank of India for release of foreign exchange, attaching to their application, letters of invitations from Institutions/Hospitals/Colleges received by them in their personal name.* Passports will also be screened by the Reserve Bank of India before release of foreign exchange.

(*Note:* In case the Reserve Bank releases foreign exchange to the applicant, then the applicant will not be eligible for US $100 under the Foreign Travel Scheme; as per rules of the Reserve Bank).

(vii) *Baggage Allowance:*

20 Kgs for each participant. Charges for excess luggage will have to be paid by person concerned Luggage will be weighed at each City before departure, on individual basis (Hand Bags, Brief Cases etc., weighable). Overcoat/Rain Coats, Still Camera, a pair of Binoculars and Ladies Purses are not weighed

(viii) *Clothing for Men Only:*

The following are suggested:

A light-weight medium size suitcase, at least two suits—one wear and pack one—a light-weight overcoat-cum-rain coat to be carried in hand, 4 Cottlene or Terylene Shirts, 2 sets of Sleeping Pyjamas, dressing gown, 4 pairs of socks, 4 handkerchieves, ties, undergarments to personal requirement, shaving kit, a pair of shoes, one washing soap and one bath towel.

(ix) *Clothing for Ladies:*

The following are suggested:

6-8 silk sarees or dresses handkerchieves, vanity bag containing toiletory goods and makeup materials, undergarments, one light-weight overcoat-cum-rain coat, 2 pairs of stockings, 2 pairs of shoes, one light-weight woollen cardigan, dressing gown and one bath towel These things are to be packed in a light weight medium size suitcase.

(x) *Jewellery Restrictions:*

Every individual is allowed to carry on person jewellery worth Rs. 2,000/- only. Export certificate should be obtained from the Customs Authorities for the jewellery taken out of the country. This will avoid any difficulty on return

V National Convention of Singapore Medical Association

In course of a circular to the Hony Secretaries of all Local Branches of I M A. Dr. P. C. Bhatla, Hony. General Secretary, states:

The Indian Medical Association has received information that the Singapore Medical Association is holding the Fifth National Medical Convention on March 17-24, 1973.

The Singapore Cancer Society will also participate in the Convention The Scientific Programme for the week-long Convention will consist of papers and symposia on the following topics: (1) Drug Abuse (2) Cancer in Singapore Today

The above information may kindly be circulated to the members of your branch and such of the members as are willing to attend the Convention may kindly get in touch with the following direct, under intimation to this office:

Dr. Lee Swee Kok. Chairman, Convention Organising Committee, Singapore Medical Association, Alumni Medical Centre, 4-A, College Road, Singapore 3

Members will have to bear their own travelling, per diem and other expenses.

Branch Notes

MYSORE STATE BRANCH

Hubli Branch - - The annual general meeting was held on 21-9-71 at Karnatak Medical College. The Hony. Secretary Dr. Sontakee placed the annual report for 1970-71. He stated in his report that the branch had 130 members on the role at the close of the year. During the year a number of symposia, seminars and panel discussions was held. The members of the staff of the Medical College and Hospital and the branch sincerely co-operated in making the meetings a success. The new system of holding the meetings at the residences of individual members also proved effective. The branch hosted a meeting of the State Council during the year. A panel discussion was arranged on this occasion on "Pain in Abdomen". Many members of the State Council also participated in the discussion. Dr. A. K. N. Sinha, President and Dr. Panwala Vice-President, visited the branch on August, 1971. A meeting was arranged in their honour which was addressed by both of them. The branch had approached the Hubli-Dharwar Corporation authorities for grant of Rs 10,000/- and the matter was under consideration. On behalf of the branch the Dean of Karnatak Medical College took up with the Government the issue of acquiring a suitable site for the building of the branch. The building fund of the branch was augmented by Rs. 3,000/- through savings from subscription, interest on fixed deposit and donation from members, etc.

The following were elected office-bearers for 1971-72:

President — Dr. R. J. Amritraj; Vice-President — Dr. Saralabai Rao; Secretary — Dr M. Nityaseelan; Joint Secretary - Dr V D. Sapare; Managing Committee Members- Dr Prabhakar D Sonatakee, C R. Raghu, S. D. Datye, R S C. Murthy, Sadashiv Hande, K. R. Jituri, M R Kamat and J. K Nadig, Treasurer—Dr. S. V. Nadig, Internal Auditor Dr K. S. Kamat; Representatives to State Council Dr. P Sadanand Rao, Dr. M. Maiya and Dr. B R Vaidya; Representatives to Central Council—Dr. G. V. Joshi and Dr. V. T. Kothari.

Shimoga Branch — The annual general meeting was held on 3-10-71 The following were elected office-bearers for the year 1971-72.

President Dr. G. Vasudeva Rao; Vice President — Dr V. L Pandit; Secretary Dr. P. Narayan; Treasurer —Dr K G Nagesh, Members of the Executive Committee— Drs B M Chikkaswamy, G. Puttamma, Shridhar Upadhya, M N. Shivakumar, and A. Basavannaiah; Representatives to State Council — Drs. B. R. Shama Rao, A. Eswarappa and S. Sadananda; Representatives to Central Council—Dr. C. H. Sheshachalaiah and Dr. B. V. Rajanna.

Following the election of office-bearers a symposium was held on Renal Failure. Dr K. P. Ganeshan, K. L Agarwal, A Bhaskar Rao—all from Mangalore, took part in the symposium Another symposium was held on Diabetes in which Drs C. D Shrinivasa Murthy, V. Shrinivas and B V Rajagopal — all from Mysore, participated Members of the I.M.A. club staged a drama on this occasion.

South Kanara Branch —A seminar on Obesity was arranged jointly with Lions Club of Mulki on 9-3-71. Dr. M V. Chari acted as the moderator. Drs. V. R. Kamath, A. Bhaskar Rao, R. S. Mahale, N. Ramanna and B. N. Gadiyar were the participants.

The branch observed the World Health Day on 7-4-71 jointly with the Department of Public Health and Family Planning at Kasturba Medical College auditorium. Dr. Chari was the chief speaker on the theme "A Full Life Despite Diabetes". Dr. M. P. Pai presided.

On an invitation from the Coorg branch a joint meeting was held at Meracara on 17-4-71. Dr. Ramesh welcomed the gathering and Dr. Chari presided. The following members from South Kanara Branch spoke on different scientific subjects: Dr. K. Sudhakar Shetty, R. S. Mahale, B. R. Rama Rao, V. R. Kamath and M. V. Chari. Dr. Kishalappa proposed the vote of thanks.

At a meeting held under the joint auspices of the branch and Cannanore Branch at Panambur on 9-5-71, Dr. V. Mahadevan gave a talk on Do's and Dont's in Orthopaedics with special reference to rehabilitation Dr. B. M. Hegde spoke on Recent Advances in Management of Asthma. Dr. P. Kothandaraman spoke on Head Injuries. Dr. P. N. Ariga presided.

At a clinical meeting held on 13-6-71 with Dr. M. Ramanna in the chair, Dr. M. Santaram Shetty gave a talk on Periarthritis of the Shoulder.

On 11-7-71 at a meeting held on the Kasturba Medical College Auditorium, Dr. D. Shenoy spoke on selected aspects of recent advances in orthopaedics. Dr. R. N. Sujir spoke on Squint.

A number of interesting cases was presented by the staff of Kasturba Medical College attached to Wenlock hospital at a meeting held on 4 9-71. The meeting was organised under the joint auspices of the Clinical Society of Wenlock and Lady Goschen Hospitals and Kasturba Medical College, Mangalore, as well as the Clinical Society of Kasturba General Hospital, Manipal.

At a meeting held by the Hind Kusht Nivaran Sangh at Mudarangady on 26-9-71, Dr. Rodrigues, Superintendent of St. Joseph's Leprosy Hospital, Kankanady, spoke on the latest trends in the treatment of leprosy. Dr. A. F. Coelho spoke on the challenge of leprosy and cited statistics to show that there was quite a big number of leprosy patients requiring care. Dr A N. Subbarao, Medical Officer-in-charge of Leprosy Clinic, proposed the vote of thanks. Dr. M. V. Chari presided over the meeting.

Tumkur Branch — The following were elected office-bearers for 1971-72 at a general meeting held on 5-10 71 under the presidentship of Dr. M. Rajasekharappa, Dist Surgeon:

President—Dr M. Rajasekharappa; Vice-Presidents—Drs. K S S Dass and D P Narash mamurthy, Hony. Secretary — Dr Girigowda, Joint Secretary — Dr C. Jayaramarao; Treasurer—Dr. N M Basavaraj, Executive Committee Members — Drs K Lakkanna, H S Umapathaiah, Venkataramaiah, Visveswaraiah, Jagadesh and N. Jayanthi, Representatives to State Council--Drs H. Shivaram and Venkataramaiah, Representatives to Central Council—Dr. Visveswaraiah

NAGALAND STATE BRANCH

Tuensang Branch — A meeting of the doctors of Tuensang was held on 9-10-71 with Dr. I. Longri in the chair with a view to reviving the activities of the branch. The proposal moved to that effect by Dr. Sharma and seconded by Dr. I. Hussain was unanimously passed. At the outset the meeting condoled the demise of Dr Chinmoy Gupta and Dr. Mustaffi. The members observed one minute's silence as a mark of respect to the departed souls.

The following were elected office-bearers for the year 1971-72:

President—Dr. R. Sonowal; Vice-President—Dr. Ikram Hussain; Hony. Secretary — Dr. L. M. Murry; Joint Secretary—Dr. I. Longri; Treasurer—Dr. Arao Kikon; Members of the Working Committee: Dr. I. Ali and Dr. Gogoi.

It was decided to fix Rs. 20/- as membership fee per year. It was also decided to request the Director of Health Services to allow all medical officers posted in the outstation areas to attend the I M A meetings and the Hony. State Secretary was requested to pursue the matter. A resolution was passed suggesting establishment of a library, which should be attached to the Civil Hospital, Tuensang as it had already been done at Civil Hospital, Kohima with a view to promoting the academic interest of the members. In another resolution the meeting urged the State Medical Department to provide a Rest House for outstation doctors at Tuensang town and residential accommodation both in the headquarters and the outlying areas for doctors posted in dispensaries and hospitals.

The following were elected delegates to the 5th Annual Conference of the Nagaland State Branch at Mokokchung branch: 1 Dr. S. N. Hazarika; 2. Dr. A. Kikon; 3. Dr. Rajbongshi.

ORISSA STATE BRANCH

Bhubaneswar Branch – The following were elected office-bearers for the year 1971-72:

President — Dr. G. C. Pattanayak; Vice-President—Dr. S. C. Banerjee; Hony. Secretary — Dr. B. C. Pattanaik; Joint Secretary—Dr. R. R. Mohanty and Dr. N. S. Dandapat, Treasurer—Dr. B. C. Pattanaik; Members of the Executive Body—Drs S. N. Patnaik, S. C. Das and (Miss) J. M. Patnaik; Representative to State Council—Dr. S. N Patnaik.

Puri Branch —A meeting was held on 22-8-71. Dr. B. K. Nanda, Hony. State Secretary attended the meeting on special invitation. Dr Nanda addressed the members on Doctors Demands Day. On 29-8-71 a press conference was held under the chairmanship of Dr. D. P. Hota, who explained to the press representatives the demands on which the day was being observed.

A general meeting was held on 1-9-71 under the chairmanship of Dr. S. N. Acharya. After a lively discussion on the memorandum issued by the I M A. in connection with the Demands Day, a copy of the same was forwarded through the Chief District Medical Officer, Puri, to the Prime Minister of India.

RAJASTHAN STATE BRANCH

At the 10th Rajasthan Medical Conference held at Udaipur the following were elected office-bearers of the State Branch for 1971-72

President—Dr R Sharma (Jaipur); Vice-Presidents—Dr H N, Mangal (Jodhpur), Dr B R Madan (Bikaner) and Dr Hari Charan Mathur (Jaipur); Hony. State Secretary—Dr Gyan Prakash (Jaipur). Joint Secretaries—Dr. K. C Rai (Ajmer), Dr B M Bohra (Sirohi) and Dr. K. K Sarin (Jaipur) Treasurer—Dr M L Gupta (Jaipur); Auditor—Dr. S. L. Nyati (Udaipur); Representatives to the Working Committee of I M A —Dr R Sharma (Jaipur) and Dr H S Ahluwalia (Jodhpur), Alternative Representatives—Dr Gyan Prakash (Jaipur) and Dr H N. Mangal (Jodhpur), Members of the State Working Committee—Drs. D S. Taterh (Kota), H. N Mangal (Jodhpur), G. S. Chaplot (Udaipur), S C. Shukla (Sirohi), B. P. Mathur (Karauli) and Lalit Kumar Mehta (Udaipur).

Bikaner Branch —At a general meeting the following were elected office-bearers for the year 1971-72:

President—Dr V P S. Tomar; Vice-Presidents—Drs. H. L. Khanna, H. C. Saxena, (Mrs) C. Sarin; Treasurer —Dr. H R. Sharma; Hony. Secretary—Dr. Bal Narayan Purohit; Joint Secretary—Dr Ashok Nawani; Members of the Executive Committee—Drs. R. N. Mathur, R. K. Sharma, A. K. Pendse, C. L. Harsh, G. S. Chawala and D. K. Satsangi.

Udaipur Branch — The annual general meeting was held on 13-10-71 in the lecture theatre of R. N. T. Medical College, Udaipur. The following were elected office-bearers for 1971-72:

President—Dr. H K. Bedi; Vice-Presidents—Dr. S. P. Mongia and Dr. O. P. Gupta; Hony Secretary—Dr. M. K. Dube; Treasurer — Dr. P. S. Gehlot; Scientific Registrar—Dr. H. N. S. Bhatnagar, and Dr. Lalit Mehta; Members of the Executive Committee—Drs. L. S. Dashora, D S. Rathore, A. S. Gupta and Rajendra Agarwal; Representatives to Central Council—Dr. D. R. Shah and Dr. K. P. Singh; Representatives to State Council—Drs. R. Shrimal, J. C. Deopura, L. K. Kothari and G. C. Lodha.

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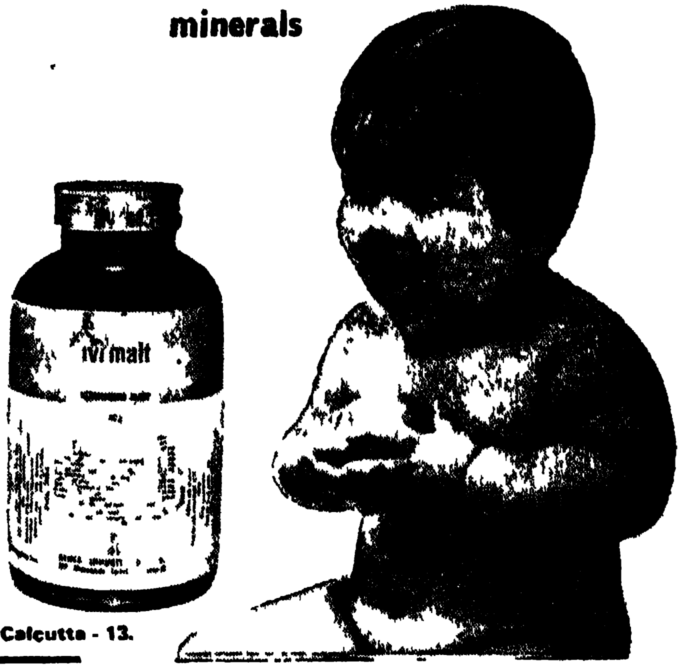

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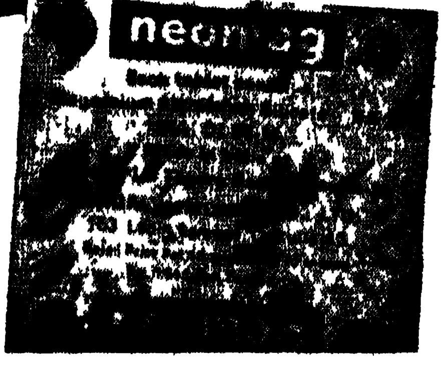

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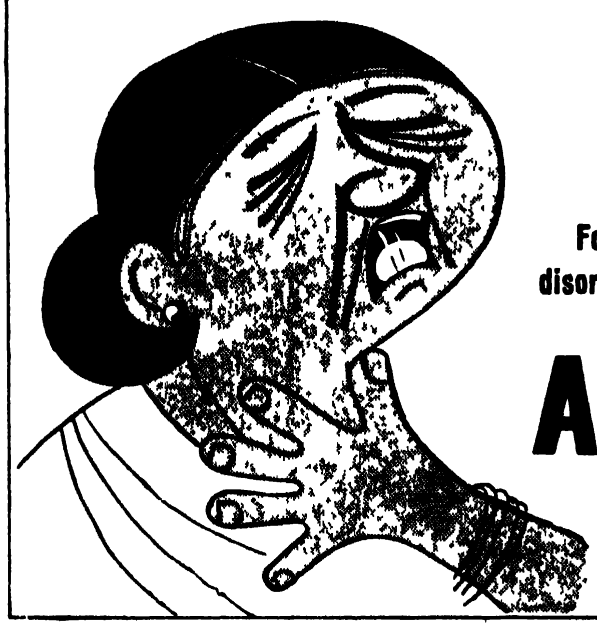

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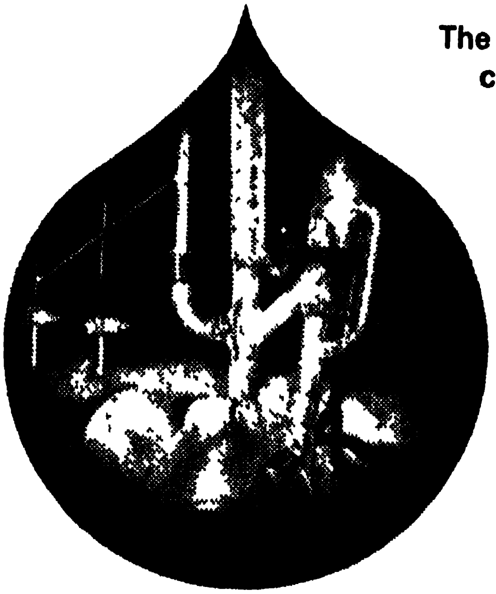

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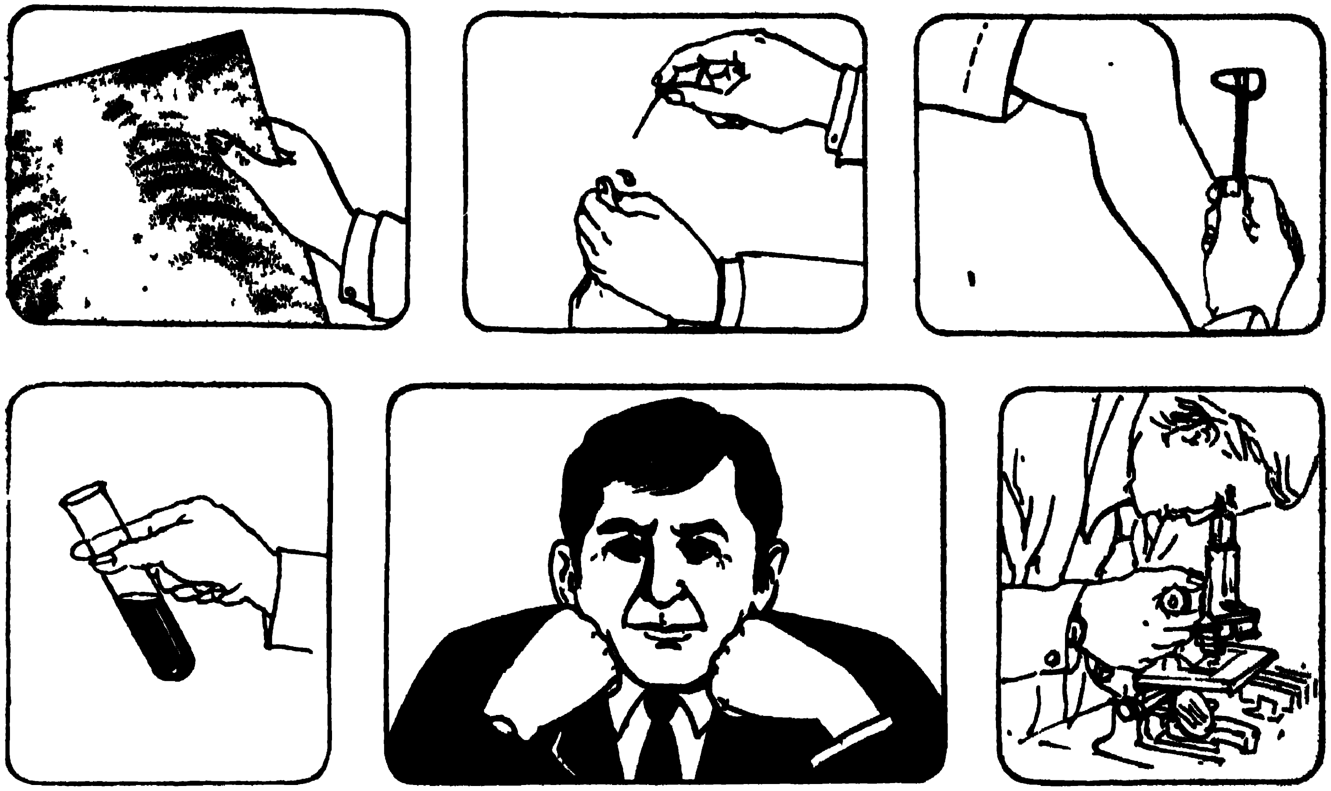

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Microfined Paracetamol

Resemblance is no criterion for selection

Particle size, solubility, and rate of absorption make major difference in therapeutic response and efficacy of the product.

THEMIS
PHARMACEUTICALS,
LAB ORGASYN DIVISION)
8 Suren Road Bombay 69 AS

Reduce to nil with Reducin

Reduce to nil with Reducin • Reduce to nil with Reducin

Reduce to nil...

PAIN

INFLAMMATION

SWELLING

With
UNIQUE'S

REDUCIN

Brand of Oxyphenbutazone B.P

Each tablet contains:
Oxyphenbutazone B P .. 100 mg

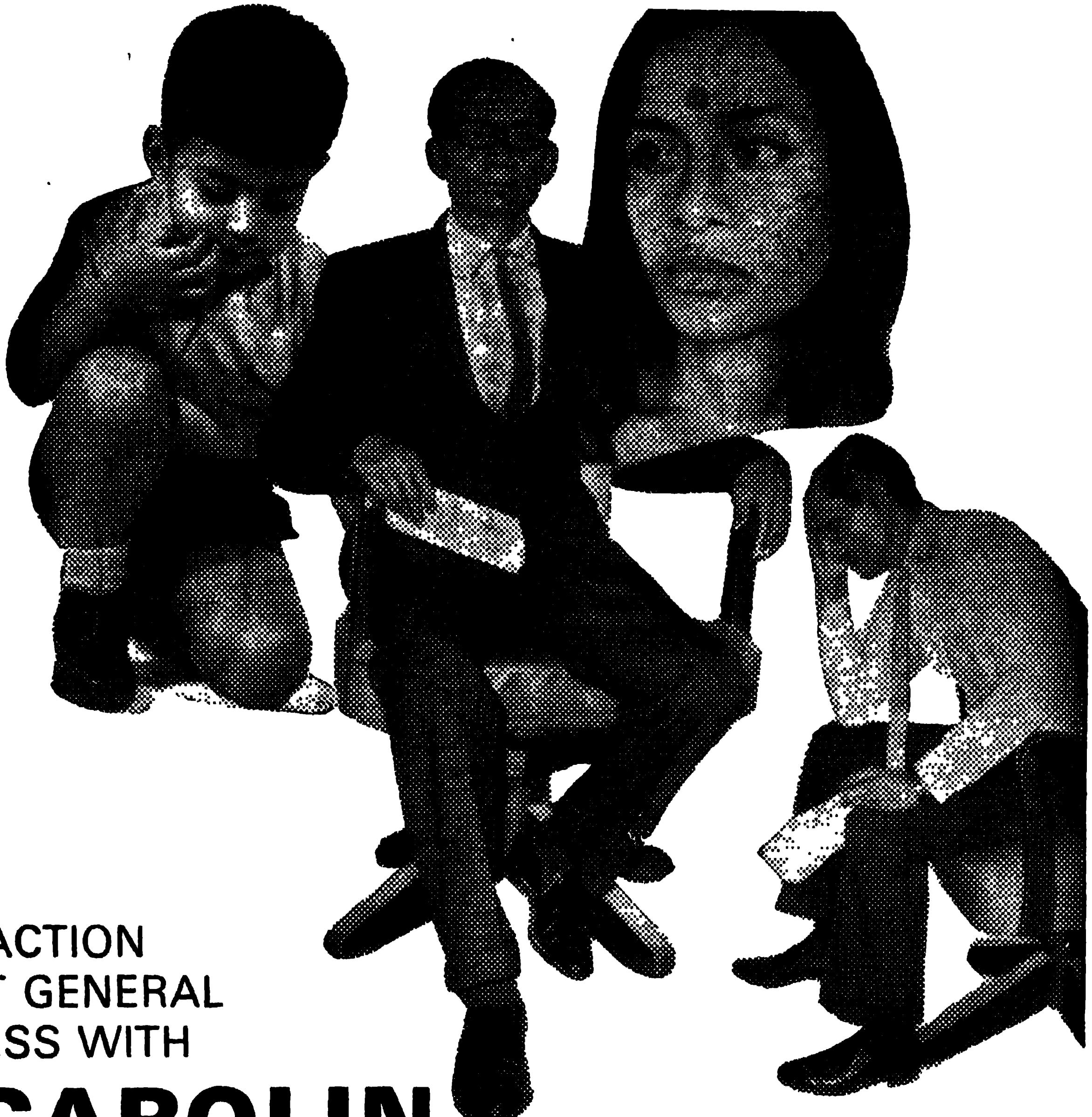
INDICATIONS.
All types of inflammation and
swelling due to trauma infections
or surgical operation

PRESENTATION
Sugar coated tablets in strips of 10
boxes of 50 strips of 10,
bottles of 500 and 1000

Manufactured in India by:
UNIQUE PHARMACEUTICAL LABS.,
83 B & C, Dr A. B. Road,
Worli, Bombay-18..

Reduce to nil with Reducin • Reduce to nil with Reducin

Reduce to nil with Reducin



DIRECT ACTION AGAINST GENERAL WEAKNESS WITH

DOCABOLIN

—strikes at the root cause of weakness, dizziness, low blood pressure, appetite loss and low vitality.

Docabolin is by far the best general restorative available in the market today, because it strikes at the physiological root of malfunctioning systems after illness. Docabolin normalises blood pressure by restoring proper electrolyte and water balance. It also mobilises serum proteins for lean tissue formation which increases the body's need for food thus stimulating appetite. Which, in turn strengthens the system and shortens the period of convalescence. Docabolin improves the blood picture with no necessity for haematinics. Docabolin promotes the synthesis of contractile tissues which improve muscle strength. In short, Docabolin tones up the whole system and restores normalcy faster.

Presentation : Each 1 ml. ampoule contains : Norandrostenolone Phenylpropionate B. P. 25 mg. Desoxycorticosterone Phenylpropionate 10 mg. dissolved in oil.

Dosage : Adults : One I. M. injection of 1 ml. every week for 4-6 weeks . Children Upto 0.5 ml. for 4-6 weeks.

ORGANON (INDIA) LIMITED,
Himalaya House,
38, Chowringhee Road, Calcutta-16.

Bensons 2312A

NOW *manufactured and offered by Fairdeal*

MYCODERM

Dry spread for dermatosis

Indications :

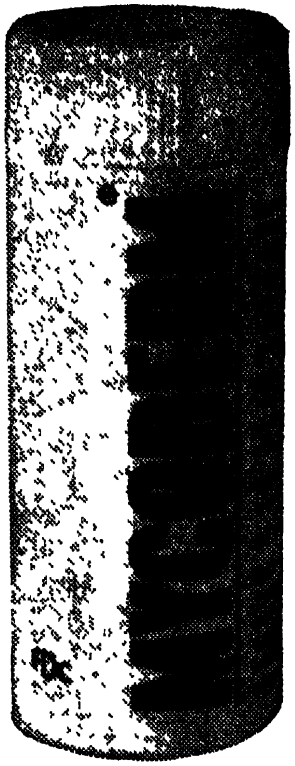
Tinea corporis, T. cruris, T. pedis,
Intertrigo, Miliaria rubra, Seborrheic dermatitis,
Diaper dermatitis, Hyperhidrosis, Bromidrosis.

Application :
For external use as a dusting powder

Presentation :
Polythene container of 100 g

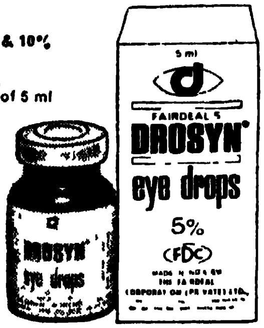
FDC

Made in India by :
THE FAIRDEAL CORPORATION (PRIVATE) LTD.,
142 48 SWAMI VIVEKANAND ROAD JOGESHWARI BOMBAY 60 NB.

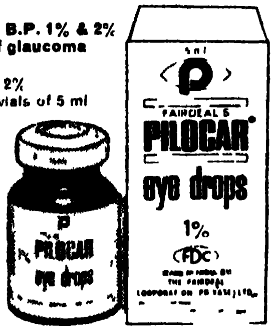


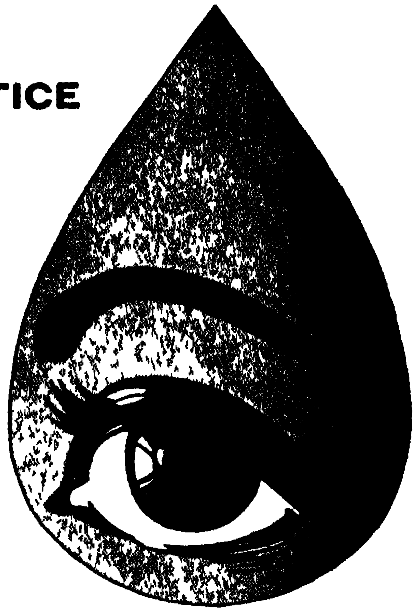
FAIRDEAL'S DEPENDABLE RANGE IN OPHTHALMIC PRACTICE

DROSYN®
eye drops
Phenylephrine hydrochloride B P 5% & 10%
A potent mydriatic
Presentation 5 % & 10% solution in dropper vials of 5 ml

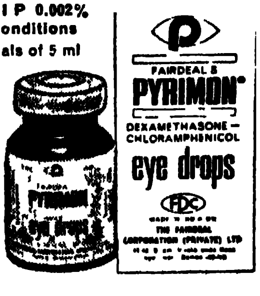


PILOCAR®
eye drops
Pilocarpine nitrate B.P. 1% & 2%
In the treatment of glaucoma
A potent miotic
Presentation 1% & 2% solution in dropper vials of 5 ml

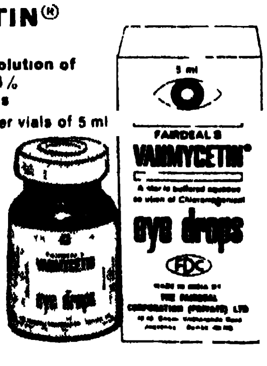




PYRIMON®
eye drops
Dexamethasone B P. 0.1%
chloramphenicol I P 1%
phenylmercuric nitrate I P 0.002%
For inflammatory eye conditions
Presentation · Dropper vials of 5 ml


FAIRDEAL'S
PYRIMON®
DEXAMETHASONE – CHLORAMPHENICOL
eye drops
FDC
THE FAIRDEAL CORPORATION (PRIVATE) LTD
PYRIMON
eye drops

VANMYCETIN®
eye drops
A sterile aqueous solution of chloramphenicol 0 4 %
For ocular infections
Presentation Dropper vials of 5 ml



Detailed literature on request

Made in India by:
THE FAIRDEAL CORPORATION (PRIVATE) LIMITED,
142-48, Swami Vivekananda Road,
Jogeshwari, Bombay-60-NB.

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YET ANOTHER ALEMBIC 'FIRST'

HERMIN

FOR EFFECTIVE INFUSION OF ESSENTIAL AMINO ACIDS

Supply : 200 ml. bottles.

HERMIN with its rational proportion of Amino Acids in solution with Sorbitol is a dependable formula for the effective synthesis of body proteins. ■ A HERMIN infusion is superior to protein hydrolysates in respect of concentration, purity, effectiveness and tolerance.

Each ml. contains:

L-Lysine Hydrochloride Monohydrate	23 mg.	L-Phenylalanine	9 6 mg.
L-Threonine	7 mg.	L-Valine	6.4 mg
L-Methionine	6 8 mg.	L-Arginine Hydrochloride	10 9 mg.
L-Tryptophan	3 mg.	L-Histidine Hydrochloride Monohydrate	4 7 mg.
L-Leucine	10 mg.	Glycine	6 mg.
L-Isoleucine	6.6 mg.	Sorbitol	50 mg.

A trusted (Alembic) product

ALEMBIC CHEMICAL WORKS CO. LTD., BARODA 3.

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